The Builder.

VOL. XIV.—No. 695.

TAKE your ways straight is a Divine commandment, to which a second application may be given. In connection with the plan we recommended the other day (p. 269), for the formation of a grand main street, leading from Piccadilly to Cheapside, there are some points coincident with that object which ought not to pass unobserved. If London were built throughout in the so-so character of the larger portion of its vast extent; if there were no fine squares, no gardens and looses, no commanding buildings and places (or piazzas), then we should not have so much to deplore the original laying out of the streets, ranging, as they do, in all directions but the rectangular. The central quarters even are nearly all obnoxious to the same objection;—the nearer the Temple or the Royal Court, the worse the lanes, the greater the "bizarrerie" of both buildings and arrangements, and the more contemptible the purlieu! Near Gray's-inn, Leather-lane, Baldwin's-gardens, with other familiar places, are too well known: near the Temple, Essex-street is the most respectable avenue: near St. Paul's, Paternoster-row, Ave Maria-lane, Amen-corner, &c. &c. keep up at a respectful distance the invariable characteristic of the ancient cathedral, viz. a plea, "ad misericordiam," for mundane externals: near St. Mary's-le-Strand, and close upon St. Clement's Danes, *Holywell*-street marks again the sanctuary,—the place formerly resorted to for its living waters, is no longer the fountain of health or of *piety;* but near Lincoln's-inn-fields,—how shall we describe the sinuosities, the complexity, and the filth which block up and degrade the very heart of the metropolis? Here is the largest and best situated of our squares (offering a causeway leading direct between the two great arteries of Oxford-street and the Strand) comparatively useless and deserted: it runs nearly half way between both, and yet there is no advantage taken of the easement it offers for a grand traverse street.

A line drawn southward from it, on the west side, would cut the dens of Clare market and street, Vere-street, Duke-street, and other *defiles*, and issue out not far from the front of Somerset House, by Newcastle-street, eastward of St. Mary's-le-Strand.

A little violence might be done to the end of the venerable stack of Holywell-street, one house at the end of which block should come down, to make an appropriate opening; and in continuation large clearances should be made through Clare-market, and the vicinal heaps of dingy houses, which seem to have been accidentally ranged as a sort of maze to amuse the special pleaders who formerly occupied New-inn, Lyon's-inn, and all the other ins as well as outs of the region.

What a misfortune would it be, if the streets and lanes above-named, or any of them, were to be fastened upon posterity by the erection upon the old sites of magnificent structures, such as those which in the City have fixed for long years the narrows of Throgmorton-street, of Lombard-street, of Threadneedle-street, and other leading ways, formerly immortalized by trade, but now by noble buildings.

No, the rising taste of our day, and spirit of improvement, assure us that, in any changes meditated, and hereafter to be carried out, the first requisite of a great population must be considered, and that is an open and direct access from town to city, with equally open and convenient lines of traverse between the principal portions.

Allow St. Paul's churchyard to be bordered with Titanic warehouses, rivalling Cook's emporium, and extend the principle to Paternoster-row,—then, indeed, would St. Paul's be in a fix, and its lofty graces, if not outshone, at least further obscured from passing admiration.

The neighbourhood of Clare-market is tolerably secure, at present, from being fixed or stereo-structured after the manner of the City. The sites are not of the value, nor are the shaky tenements: nor are the interests of monthly tenants likely to increase the purchase considerably; but once practicate a grand leading street through that locality, and an increase of 200 per cent. will be added to the value. Therefore it is, that in any plan for extensive changes, a wide scope should be taken in the first appropriation of such poor and crowded neighbourhoods; and more particularly due care should be had for the allocation and arrangement of *suitable lodging-houses* for the evicted occupants. The model lodging-house has too much of the poor-house, or parochial, or eleemosinary character, to be palatable to the industrial classes of our day; not so streets with separate houses, having but *two tenements* upon a floor: these would be eagerly sought by clerks and assistants, and respectable operatives, having families; to whom propinquity to their avocations would render commodious and moderately-priced chambers an inestimable boon.

The great traverse street (suppose we call it Lincoln-street) would issue into Holborn, and, bearing northward, come on to King-street and by Southampton-row, and afterwards Seymour-street, into Hampstead-road, and so *straight* from the Strand for a distance of nearly three miles. The short interval between Orange-street and Holborn (about 300 feet) should be opened respectably, so as to form a grand street, surpassed by none other; having in its course Russell-square and Lincoln's-inn-fields as vents, and Oxford-street and the New-road as traverses; but, in fact, the way is made already, as will be seen by reference to the map: it needs only to be opened out and connected at the intervals described.

Such a plan as this,—so easily effected; comparatively, so inexpensive; offering to the largest municipalized congregation of earth easements and facilities hardly to be calculated, would act as a ventilating duct, whilst it would give scope to free intercommunication. It may have occurred to many, and is now urged as a corollary to the preceding article of the "Via Sacra."

ON DECORATIVE PAINTING OF THE THIRTEENTH, FOURTEENTH, AND PART OF THE FIFTEENTH CENTURIES.*

IN a work upon ornament, recently published by the School of Design, it has been well observed that, for want of a more general knowledge of the variety of styles, the designer has been reduced to merely copying his neighbour, and hence the prevalence of the Louis Quatorze and Roccoco styles in the great London Exhibition of 1851. An extension of knowledge thus recognised as so important, leads to experience, and without these qualifications the most brilliant genius must be comparatively lost.

In bringing forward this matter, I may be said to hold a somewhat anomalous position. Without being an architect, I venture to address those who have made architecture their chief study. It is not upon that glorious science direct that I propose to offer any observations, but upon her important handmaid *painting*, and, as far as is inseparably allied with her, *sculpture*, that I shall venture to address you. Painting, then, as subservient to architecture, where the internal composition and arrangement of colour *must accord with a given space*, is to be my theme; and that rather in the way of pointing out examples of what has been done, than to lay down laws for guidance. I conceive it to be more useful, as I have had the advantage of travelling and spending much time abroad, to give a few notes of some of the most important examples of figure-painting connected with architecture, arranging them in chronological order, and touching upon the leading historical facts associated with them, rather than to confine myself to architectural ornament and patterns alone.

At the commencement of the thirteenth century, King John had just been seated on the throne of England.

The crusaders from the West were thundering at the gates of Constantinople, no longer to be recognized as a city occupied by descendants of the Roman emperors, who had deserted the banks of the Tiber since the days of Constantine. More Greek as a nation, and in constant intercourse with Persia and other nations of the East, they maintained tastes and customs totally different from those in the West. The very name of their city in use before the advent of the Romans was not extirpated; for the original name Byzantium is still retained, and we yet speak of Byzantine art and the Byzantine empire, although referring to a date subsequent to the conversion of the city to Christianity, and the Romans had, as the seat of empire, endowed it with the name of Constantinople.

The wealth of the city of the Greco-Roman empire was exhausted at the time of the siege, and Nicetas, an eye-witness, gives a lamentable account of the plunder and misconduct of the Western assailants when they became masters of the city. Then it was that the remaining statues that had been transported to Constantinople, and had escaped the ravages of time, were finally doomed. The last works of Myron, Polycletus, and Lysippus were melted or pounded into fragments for mortar, and many a fabric of the most costly material was wantonly destroyed. But to the rich stuffs and patterns, the elaborately-wrought metal ornaments, furniture, and utensils, that escaped destruction, and were transported to distant climates, may be assigned no trifling importance in the influence they exercised on foreign tastes. The sack of Constantinople, or Byzantium, carried a peculiarly Oriental taste to the far West in 1204, and the same city 250 years later exercised an almost greater influence when it received the Turks for its masters, and poured forth the remainders of the Greeks and the descendants of the Roman empire.

To return to our starting-point, the reign of King John, before the Italians of the middle ages could point to any one building of similar importance, a magnificent fabric arose in England (1206), with sculptures fully equal both in execution and design to the works of the Italian Niccola Pisano, who appeared nearly half a century later. This was the present beautiful cathedral of Wells; and another edifice of similar character, but still greater purity, was founded fourteen years later. The cathedral of Salisbury, with its chapter-house and exquisite Gothic sculptures, was founded 1220.

The condition of Italian art at this period may be inferred from a famous mosaic on the outside of the Duomo, or Cathedral of Spoleto, by one Solsternus, dated (according to Rossini) 1207.

The taste for the earlier Christian architecture, after it had emerged from the catacombs, at the time of Honorius and the Empress Galla Placidia (440 A.D.), will be seen in a view of the interior of her chapel at Ravenna.

During the reign of King John, two religious enthusiasts arose, independently of each other, with the desire of reforming the abuses and corrupt life of the monastic clergy. They both professed poverty, and became founders of the mendicant orders called, from their names,

* From a lecture by Mr. G. Scharf, jun. read at the Architectural Museum on the 13th inst.

Domenican and Franciscan. St. Domenic, in Spain, by his active zeal carried all before him, and by his preaching led to the fifth crusade, and, above all, to the persecution of the Albigenses. St. Francis lived retired in his convent at Assisi, near Perugia, and there died. Both of these holy men exercised no small influence on the arts; not so much by their lives, as by their deaths, for it was thought necessary upon their interment and canonization to bestow all honours possible upon their memory, and the arts were called into requisition. A magnificent church, with paintings, was reared in honour of St. Francis, at Assisi; and a superb sarcophagus adorned with sculpture, to St. Domenic, at Bologna.

The order of St. Domenic was confirmed the same year that Henry III. ascended the throne, and the order of St. Francis seven years later. Niccola Pisano, the great sculptor, began the Sarcophagus of St. Domenic in 1234.

In 1228 the great convent church and monument was begun to the memory of St. Francis. It was the work of a German architect named Jacopo di Lapo, who was appointed by Frederick II. emperor and king of Sicily. The church was completed in two years, and is the first specimen of Pointed architecture north of Rome. This style, peculiar hitherto to Sicily, had been imported from the east and established by the Saracens, who had spread themselves so rapidly along the Mediterranean. The emperor, being a Sicilian, may have been designedly instrumental in inculcating the new style. As a specimen of what it had already attained in Sicily, I would refer to the Chapel of Monreale, near Palermo, 1174. Giunta Pisano was the leading artist of this time in Italy. He executed a portrait of St. Francis, from the life, still preserved at Assisi, and contributed several fresco paintings to the walls of the upper church. All this happened before the birth of Cimabue, whom Vasari claims as the father of Italian painting. Meanwhile, our own country was not indifferent to the fine arts. Henry III. however weak he may have been as a ruler, was an earnest patron of the fine arts: he built Westminster Abbey and a magnificent shrine to Edward the Confessor.

At the same time, Bishop Poore, having erected the stately cathedral of Salisbury, commenced the celebrated nine altars at Durham.

England has a greater amount of records still preserved, of disbursements and orders given in remote times, than any other country, and it is very interesting to turn to these old documents, laid up at Westminster and in the Tower, and read sums paid and orders given for such and such paintings. I append two or three, both to show the taste of our ancestors at this period and the choice of subjects for their palaces and chapels.

In the year 1233 (the year of the establishment of the Inquisition), an order was given to the Sheriff of Southampton to have the King's wainscoted chamber in Winchester Castle repainted with histories and pictures.

In 1235 the Castle Chapel at Guildford was to be adorned with two tablets, one a crucifixion with Mary and John; the other a Majesty and the Four Evangelists.

In 1236 Henry issued an order to have the wall of his chamber painted green like a curtain.

In the year following one of the chambers was entrusted to the sheriff of Southampton to be coloured green, and starred with gold, and painted with the histories of the Old and New Testament. Oil and varnish are especially included among the materials used in the year 1238.

The keepers of the Tower of London were required to have the chapel of St. John whitewashed, and painted glass to be inserted. The church of St. Peter within the Tower to be beautified also.

In 1242, when Cimabue was only two years old, the king ordered a series of pictures from the Old and New Testament to be wrought in the chapel of Windsor Castle; they were not, however, finished till six years after.

In 1245 the Sainte Chapelle at Paris, and the nave and transepts of our Westminster Abbey were commenced, the Tower of Chichester had been just completed, and Rheims Cathedral also, by Robert de Coucy.

St. Stephen's Chapel, at Westminster, a fair parallel to the Sainte Chapelle, was just built, and an order is extant of 1245, to Edward, the son of Odo, the king's goldsmith, to paint on one side of the chancel, a beautiful figure of the Blessed Virgin, and on the other the king and queen. The same artist was desired in 1250, to paint in St. Stephen's Chapel, Apostles, the Last Judgment, at the west end, and the portrait of the Blessed Virgin on a board.

In the same year, the king ordered the "History of Antioch," to be painted at the Palace of Clarendon; and Edward of Westminster desired to paint the queen's low room at Westminster, with the "gests" of Antioch, and to copy the same from a large book, to be lent by Sandford, master of the Knights Templars. In 1248, is mentioned Brother William, a monk, of Westminster. He painted the King's Chapel, at Windsor.

The sheriff of Southampton was ordered to have a St. Christopher and King Edward, and the ring with the pilgrim, painted on the west gable of the Queen's Chapel, at Winchester.

At this time, 1250, Cimabue was only ten years old. The chief material for decoration in Italy was mosaic and Tarsia, or wood inlay. In mosaic the shape of each piece of stone or glass is lost in the pattern. In opere di commesso it forms a part of the design.

The Spoleto mosaic I have already pointed out, and may mention that Cimabue, in adopting the process, greatly improved on the system, and in the year 1300 executed a fine mosaic for the tribune of the Duomo, at Pisa.

The Madonna, of Cimabue, was carried in procession to the church. The next generation included Giotto, and the illustrious poet Dante, who in the year 1300 was at the height of his political influence. Giotto, the shepherd lad, was adopted by Cimabue, and being initiated into an art that had just attained sufficient development to express passion and sentiment, the youthful painter applied this technical skill to his own poetic and original conceptions, and produced a series of works, which for intention and individuality have never yet been surpassed. Dante, the poet, assisted him, and so rapid was his pencil, that he travelled all over Italy, leaving in almost every town of importance some monument of his skill. But it was at Assisi, under the banner of St. Francis, that he most particularly distinguished himself. He also wrought in mosaic, and was summoned to Rome by the Pope.

The long reign of our Henry III. has afforded us a great variety of events and enterprises. With the reign of Edward I. is generally introduced the period of the Decorated architecture, 1272. The Early English or Pointed had prevailed in England since the death of Henry II.

In the beginning of the fourteenth century, Arnolfo da Lapo, son of the architect of the church at Assisi, died, leaving the Duomo of Florence considerably advanced, but incomplete. Brunelleschi, many years afterwards, added the dome; but in executing this wonder of mechanical skill, as we shall see presently, he merely carried into effect the designs of Arnolfo.

In 1332, Simone Memmi painted the walls of the Spanish chapel at Florence.

In the paintings of St. Stephen's Chapel, at Westminster, judging by copies and engravings extant, there is great affinity to the works of Giotto, and those in the Incoronata at Naples.

During the reign of Edward III. of England, Rienzi, the tribune, pursued his romantic career at Rome and Avignon. In the same year that the battle of Cressy was fought, 1346, Rienzi mounted the Capitol, and published his laws.

The style of art and system of employing it with allegory to address the minds of the people, is curiously shown by the banners he had painted, &c.

The same year (1354) that Rienzi died, Marino Faliero was beheaded.

The same taste for allegory and wild fables was fostered by Petrarcha; and Orcagna, in 1360, painted the "Triumph of Death and Judgment" in the Campo Santo, at Pisa; Pietro Laurati, Hermits, &c.; Giov. Pisano, erected the Campo Santo.

The year 1348 is a remarkable date for events, both in England and Italy. With us the chapels of St. Stephen, Westminster, and St. George, at Windsor, were completed and endowed; and at Florence, the most terrible plague ever known, broke out. This afforded to Boccaccio an excuse or motive for his celebrated tales,—the Decameron; and it led, with a far better feeling, to the construction of the famous tabernacle in the Or San Michele, at Florence, which was completed by Orcagna in 1359. The Perpendicular style began with Richard II. in 1377. Brunelleschi was born in 1377; Ghiberti, in 1380.

[Mr. Scharf showed numerous illustrations of the early Italian wall paintings, copies from the decorations of the Painted Chamber, and St. Stephen's Chapel, at Westminster, together with *fac-similes* of illuminations in MSS. and miniatures, by Matthew Paris, in the British Museum. He also explained the arrangement of subjects on the walls of the Campo Santo at Pisa, the Brancacci and Spanish Chapels at Florence, and the Sistine Chapel, and that of Nicholas V. in the Vatican.]

To connect varieties of style with dates and historical events, seems to me a system of the utmost importance. How often do we find the spirit and feeling of ornament and patterns allied to the habits of the day! In costume this is particularly the case, and pervades even the minutest details, from the bonnet-clasp to the shoe-button. In furniture and tapestry it is more conspicuous still; and it is not a little curious to observe, notwithstanding the comparative difficulties of intercourse, how the same fashions prevailed at the same time in France, England, Italy and Spain. I shall probably have disappointed by the manner in which I have treated the subject entrusted to me. The chief point we have to deduce from examples before us, is the connection between the period, sentiment, and style of bordering, or architectural framework, and the subject actually inserted in compartments by the figure painter with the architect at his side. We now but too frequently see strange discord between the contents of the panels or the statues and ornaments and the architecture itself. The same applies to painted glass windows, where a want of consistency may be detected. Sometimes this is owing to a *partial* use of a good original with inferior filling in, or from an injudicious use of various materials to work from.

When the designer, either on a large or small scale, who can work out every part *himself*, apportions the labours definitely and clearly to his workmen, it seems almost impossible to miss a satisfactory result. Mechanical excellence is fast rising; and whether the painter be the architect, or the architect the painter, or both of these be "rolled" into one gentleman—the sculptor,—it matters little, for they are all three inseparable.

ON THE RESTORATION AND PRESERVATION OF WOOD CARVINGS.

AT a meeting of the Institute of Architects, on the 28th ult. Mr. Henry Crace said,—Being much interested in the preservation of the various beautiful carvings of this country, more particularly those of the seventeenth century, I have considered that it might be of use to give particulars of some I have lately restored for the Worshipful Company of Mercers, in their Hall, which was rebuilt after the Fire of London, in 1666. I found the whole had been removed out of the Hall, the architect fearing they might fall from the panelling, as they were worm-eaten in parts into perfect dust, and principally kept together by the large quantity of paint, varnish, &c. they had received from time to time. A small piece of one of the leaves which Mr. Eugene Barnes, clerk to the company, had preserved, and placed under a shade, shows the perfect honeycomb the wood had been reduced to when the dust was blown out. The main stem is of deal, the fruit, flowers, &c. are of lime, pear, and beech. Had the carvings been more perfect and wholly of oak, or any one wood, I could have restored them to their primitive colour and freshness.

It may now be necessary to explain what has been done to them. The carving is of the same colour as when taken down. I merely washed it, and with a gimlet bored a number of holes in the back, and into every projecting piece of

fruit, and leaves, on the face, and placing the whole in a long trough, 15 inches deep, I covered it with a solution prepared in the following manner:—I took 16 gallons of linseed oil, with 2lbs. of litharge, finely ground, 1lb. of camphor, and 2lbs. of red lead, which I boiled for six hours, keeping it stirred, that every ingredient might be perfectly incorporated. I then dissolved 6 lbs. of bees'-wax in a gallon of spirits of turpentine, and mixed the whole, while warm, thoroughly together.

In this solution the carving remained for twenty-four hours. When taken out, I kept the face downwards, that the oil in the holes might soak down to the face of the carving, and on cutting some of the wood nearly 9 inches deep, I found it had soaked through; for I should observe that not any of the dust was blown out, as I considered it a valuable medium to form a substance for the future support of the wood; this has been accomplished, and as the dust became saturated with the oil, it increased in bulk, and rendered the carving perfectly solid.

Each panel has consumed a little more than a gallon of the solution; they have been finished about five months, are becoming quite hard, and in the space of four or five years will be as hard as any wood. I have no doubt that in twenty years they will become so hard that no knife will cut them. Every gentleman present is aware that common putty becomes so hard within that period, that in hacking out a broken square of glass the wood is frequently destroyed, the putty being harder than the wood.

In my case the ingredients used will become more quickly hard, and I am confident that the carving is now more durable than at the hour it left the carver's hands. The holes made by the gimlet are left open, that the air may penetrate to assist in the solidifying of the decayed parts of the wood: at the same time we are aware that no insect can enter it, and it is impossible for any such to subsist on the composition introduced.

With reference to the cleaning and restoring of old carvings, I can state that my experience ranges over a period of fifty years, having commenced in the restoration of the very handsome wards of Greenwich Hospital.

Before that period it was the fashion to wash the oak compartments and varnish them, by which process, and with time and filth, they had become perfectly black, or rather of a chocolate colour. We set to work to clean them, and at last succeeded in bringing them back to their original freshness; and I believe that during that period my father had the works, and afterwards my brother and myself: every ward fitted up with oak was restored.

The Chairman (Mr. Penrose) mentioned a case in which some carving that had been much worm-eaten was preserved from further injury by dropping corrosive sublimate, by means of a pin-point, into all the holes.

Mr. Crace observed, that in some of the specimens before the meeting there was only a single hole in one piece of fruit, yet the whole of the interior substance was converted into powder, and the mischief could not therefore be remedied by the use of the pin-point. The insect which had committed these ravages was a small brown beetle, about the size of a pin's head.

Mr. Jennings, Fellow, considered that the beetle was the perfect form of the worm, which was in reality the eating insect. He had seen it in both conditions, and believed it did not pass through any intermediate chrysalis state.

Mr. C. H. Smith, Hon. Member, observed that the insect which was so destructive to ship-timber was unquestionably a worm, but in the present instance he believed it was the small beetle described by Mr. Crace, being similar (except in size) to the wood-louse and the cockchafer.*

SOUTH SHIELDS BURIAL BOARD COMPETITION.—Competitors are inquiring to whom the second premium has been awarded, and when their drawings will be returned?

* At the next meeting of the Institute of Architects, to be held on Monday evening, the 2nd of June, the following Paper will be read—"On the Domestic Brick Buildings of the Sixteenth Century in Bruges, and other Places in Belgium," by R. Dennis Chantrell, Fellow. *The President.*—In consequence of the loss which has recently occurred in the family of the president, Earl de Grey, his lordship's annual *conversazione* to the members and friends of the Royal Institute of British Architects will not take place this year.

THE MATERIAL RESOURCES OF RUSSIA.*

BRICK-MAKING in Russia does not possess anything like the comparative importance it does in other countries. The greater number of the towns are built of wood. Comparing the value and progress of building and the value of bricks in France with that in Russia, the author estimates the value of bricks in France at eight millions of roubles, or thirty-two millions of francs, while the value of those in Russia he estimates at only two to two and a half millions of roubles. In France, so long ago as 1836, bricks and tiles were manufactured to the value of 28,112,000 francs; lime to the value of 23,827,000 francs; and plaster to the value of 14,714,000 francs. In Russia the brick manufacture is principally concentrated around the two capitals. The Moscow and St. Petersburg brickworks furnish at least two-fifths of the total consumption: the bricks are said to be of good quality, but very high priced. Large sized bricks cost at St. Petersburg 16 to 23 roubles per thousand: in France their price is 25 to 30 francs = $6\frac{1}{4}$ to $7\frac{1}{3}$ roubles.

The manufacture of articles in terra cotta, such as statuettes, bas-reliefs, and other architectural ornaments, has lately been introduced; and this manufacture, of which the products, especially for external architectural ornaments, are very appropriate to the climate, it is thought may gradually acquire some importance.

Adding to the brick manufacture that of lime, plaster, and other cognate industries, M. Tegoborski considers that the annual produce of the whole may be estimated at 5 millions of roubles: the number of workmen employed at about 15,000.

The glass manufacture has, it seems, made marked progress in Russia within the last ten or fifteen years. The improvements introduced into the manufacture have brought down prices; but these are still much higher than the French and Bohemian. Under a protective duty of fifty roubles per pood, equivalent to from 250 to 500 per cent. *ad valorem*, the importation in 1848 was to the value of 16,308 roubles, and in 1850 to 53,609 roubles; but the duty having been reduced from January, 1851, to twenty roubles (still equivalent to 150 per cent.), the importation for that year amounted to 78,200 roubles. Most of the Russian glass works are situated in well wooded districts, where fuel is cheap, and the great difference of price is attributed to a want of competition, or to waste or errors in the processes of manufacture. "It is somewhat remarkable, however," says M. Tegoborski, "that whilst we ought to be able to furnish common window glass cheaper than any other country, a pane which sells for forty rupees at Vienna, costs seventy-five at St. Petersburg." This he ascribes to the long carriage, and to other circumstances affecting the Russian trade in general,—bad roads, we presume, or total want of roads, being one considerable circumstance amongst those here hinted at.

The manufacture of blown glass is said to have been greatly improved of late, but still prices are very high as compared with foreign countries.

The number of glass works in Russia in 1848, according to official returns, was 223, of which 27 were in the government of Wladimir, 22 in that of Wilna, 17 in that of St. Petersburg, 11 in that of Riazan, 10 in Livonia, 26 in the kingdom of Poland, and 16 in Siberia. Besides these there were 5 or 6 in Finland, making in all about 230 establishments. The total products of the manufacture are estimated approximatively at 2,500,000 roubles, and the number of workmen employed at nearly 10,000. In France there were 165 glass-works in operation in 1836, producing to the value of 47,474,300 francs = 11,868,600 roubles; and from the progress of the manufacture since then (manifested *inter alia* by the increasing exportation) the production must now amount to 13 or 14 millions of roubles. In Austria the total produce of the glass manufacture, including crystal and looking-glasses, was valued in 1845 in the official statistics at $17\frac{1}{2}$ millions of florins = 11,025,000 roubles, and must now, it is estimated, be about 12 millions of roubles.

* See page 288, *ante*: notice of M. de Tegoborski's book.

In Russia there is a large manufacture of window glass. In the large towns the houses and public buildings are spacious, and the severity of the climate necessitates the use of double windows.

The author, on the whole, regards the glass manufacture of Russia as being progressive, but impresses on the native manufacturers the necessity of sedulously applying themselves to the introduction of those improvements which would chiefly tend to diminish the cost of production.

Cabinet work is considered as both very perfect and very inferior, "according to the side on which it is looked at,"—not in the article itself, but as regards the two phases of luxury and poverty which prevail in Russia as elsewhere. The manufacture of luxurious furniture, says M. Tegoborski, is pushed, especially at St. Petersburg, to a high degree of perfection; but, although foreign woods are as cheap as anywhere else, the prices of the manufactured articles are most exorbitant, and out of all comparison with those of other countries; so that a little exportation to St. Petersburg might not be a bad speculation. This is ascribed to the high cost of skilled labour, from the limited number of good artizans and the want of competition. Common furniture, on the other hand, is of very bad quality: the wood is seldom well seasoned, and the workmanship is almost always careless. So is it with joiners' work in buildings. The doors and windows of the middle-class houses in St. Petersburg are generally warped, and will not shut close: in the provincial towns they are said to be still worse.

The crude value of all the industries treated of by the author, he estimates roughly at 500 millions of roubles; and the value which they add to the national wealth, exclusive of the raw material worked up, he sets down at 325 millions of roubles. The total number of persons,—men, women, and children,—employed in these various industries, he slumps at six millions. For other trades and professions not comprised in these, he adds 400,000 more, including masters, journeymen, and apprentices, and forty-eight millions of roubles as the product of their labour. These results, summed up as 500 millions of roubles, crude annual value, adding to the national wealth 375 millions of roubles, he compares with those of France, adduced by Schnitzler, as upwards of three milliards, and estimated by M. Tegoborski as now at least 3,500 million francs, or 875 millions of roubles; and with those of Austria, estimated at 795 millions of florins, or 500 millions of roubles, and further increased by the author to 550 millions of roubles. He thus regards Russia as on an equality with Austria as to the value of her various industries, and as 100 to 159 with France in these respects.

Of the building-timber exported from Russia England admittedly takes upwards of three-fifths. Prussia is next in importance to England as a purchaser of Russian timber, but the larger portion of the exports to Prussia itself is on British account. The value of building-timber exported to England, in the three years ending with 1853, is estimated at 1,955,100 silver roubles: to Prussia it was 1,367,000 silver roubles. The value of the building-timber exported to all countries was 4,285,700 silver roubles. In the timber trade of the empire, beams, deals, and staves are the chief articles exported,—beams to the value of 1,987,500 silver roubles, deals to the value of 1,430,900 silver roubles, and staves to the value of 349,100 silver roubles: all other sorts are valued at 518,200 silver roubles. More than three-fifths of the timber are exported by the Baltic, and nearly one-third by European frontier. The Baltic exports are chiefly from Riga and St. Petersburg, averaging 1,485,000 roubles from the former, and 900,600 from the latter. Pine and fir beams (about 400,000 pieces) are chiefly exported by the Niemen and the Prussian port of Memel, and from the kingdom of Poland by the Vistula. Oak beams come mostly from Minsk and Volhynia to Prussian ports. Deals (about 2,000,000 pieces) are exported principally from St. Petersburg, but also from Riga, Narva, and the White Sea ports.

The average annual exports of all kinds from Russia by sea in 1849-53 are valued at

87,950,800 silver roubles, and by land 5,630,100. The imports of all kinds for same period averaged, by sea, 71,521,900 silver roubles in value, and those by land 6,394,000 silver roubles. Of the total imports, 26,363,400 silver roubles was the value of those from England alone, and 49,314,600 silver roubles that of the exports to England alone. The exports to Prussia are valued at 10,874,600 silver roubles, and the imports from Prussia 14,368,700 silver roubles, much of this traffic doubtless being also English ultimately. The next in importance to Prussia in reference to imports and exports is France, whose imports to Russia are valued at 8,301,800 silver roubles, and her exports from Russia at 8,237,600 silver roubles. It is admitted that nearly two-thirds of all the *exports* from Russia "are absorbed by the United Kingdom." Only three-tenths, however, of the total *imports* are estimated as arriving *directly* from England. France takes less than 8 per cent. of the exports, and sends nearly 10 per cent. of the imports. Austria takes about 6 per cent. of the one, and sends about 7 per cent. of the other. The general balance of exports over imports is only 20,709,200 roubles, although the trade with England alone presents an excess of exports to the extent of 22,951,200 roubles (or 3,634,000*l.*), so that all other countries taken *in cumulo* present a balance against Russia of 2,242,000 roubles only. Raw cotton and wool, dye stuffs and machinery, are the chief imports from England, and cereals, tallow, fibrous materials, and timber are the chief exports to England.

The English vessels employed in the Russian trade during 1849-53 were 3,977 in number, with a tonnage of 449,046 lasts, while those of Russia itself were only 2,188 in number, with a tonnage of 183,269 lasts. One of the next in importance was Austria, which had 638 vessels so employed, with a tonnage of 104,308 lasts. The English per centage on the whole shipping trade of Russia was 31·7, the Russian 12·9, and the Austrian 7·4. But in the triennial period 1824-28 the English per centage was 47·5, and as the Russian was then about the same as during the latter period, the shipping of other nations so employed has been on the increase, particularly the Turkish, which increased from 156 to 1,797 vessels, and the Dutch, which increased from 359 to 1,181 vessels. The Greek trade has, of course, wholly sprung up since about the earlier period,—and in 1849-53 it employed no less than 1,268 vessels, with a tonnage of 141,356 lasts, or 10·0 per cent. of the whole of the Russian shipping trade together. This is an instructive and significant item in the modern relationship of Russia to the Greeks, though, as yet, not exactly to those still of Turkey. Greece now ranks above Austria on the shipping list just quoted. It is also an important circumstance, as regards *our* influence over Russia, that "the English trade," as M. Tegoborski takes care to note, "though still foremost in rank, has lost much of its preponderance." Besides the Greek marine, the Black Sea trade of Russia has attracted a number of Italian vessels to its southern ports. The flags of all the Italian States together reckoned up only 29,333 lasts during 1824-28, but during 1849-53 that tonnage was tripled, and the Sardinian flag alone counted 78,180 lasts, and the Neapolitan 20,822.

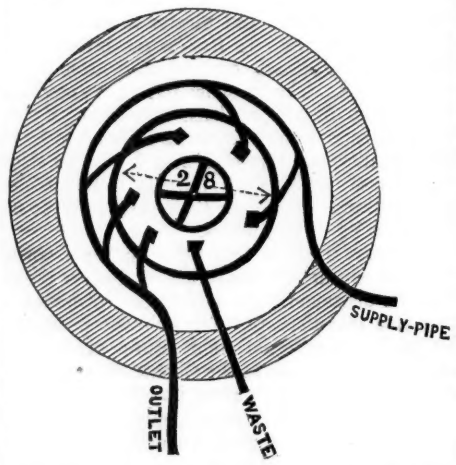
THE WATER-TOWERS AT THE CRYSTAL PALACE.

As a more intimate knowledge of the structure and character of these erections than can be gained by a mere casual observation is likely to be interesting to our readers, we subjoin a few particulars respecting them.

The foundation of each tower is composed of a ring of Portland cement concrete, the dimensions of which are,—outside diameter, 58 feet; width of the ring, 11 feet; depth, 3 feet.

On this foundation are erected 780 cubic yards of brickwork, also in Portland cement. This cylinder of brickwork is 18 feet in height, with an average thickness of 7 feet, carrying the entire structure of outer base plates, columns, face-panels, tanks, balcony floors, and roof. The diameter of each tower, from centre to centre of the columns, is 46 feet.

In the interior of the ring of brickwork, there is another foundation of Portland cement concrete, 28 feet in diameter and 5 feet thick, carrying the chimney-shaft and six water-columns. The water-column base-plates are placed equi-distant on this foundation, and branch into a circular pipe, through which the water passes both into the tank and out of the tank to the fountain. Of these six columns (communicating with the bottom of the tank), five are for the supply of the fountain, and one for the escape of surplus water. The following rough diagram will give some idea of the arrangement:—



The chimney is in the centre, and takes the smoke from the heating apparatus and boilers within the building. The height is 276 feet, the diameter 9 feet 3 inches: thickness, up to the height of 60 feet, 14 inches, after which it is reduced to 9 inches. On the top is an ornamental cap of cast-iron 14 feet in height by 16 feet in diameter.

There are eleven stories in each tower, the height between the floors being 20 feet. Winding round the chimney-shaft is a spiral staircase of iron and wood, containing 404 steps. As a means of additional stability, each tower contains ten diaphragms of wrought-iron, 5 feet wide, weighing about 6 tons. These diaphragms are all fixed between the columns and connecting pieces, and are tied together by iron rods $1\frac{3}{4}$ inch in diameter, and 32 feet in length. The total height of the towers from the first-floor to the top of the tank is 238 feet. There are ten tiers, each tier 20 feet high, making the height of the balcony-floor round the outside of the tank from the first-floor 200 feet. The tanks are 38 feet deep and 47 feet in diameter. Each tank, when full of water, contains 448,000 imperial gallons, or about 2,000 tons. The chimney-shafts go through the centre of the tanks. The total weight on the foundation when the tank is full of water will be,—

Water	2,000	tons.
Wrought-iron	240	,,
Cast-iron	638	,,
Glass, timber, lead, &c....	200	,,
	3,078	,,

Say 3,000 tons.

The pressure on the square inch at the mouth of the jet is 262 lbs. Each tower furnishes but one jet of water, which, on a calm day, will reach the altitude of from 220 to 240 feet. Mains connected with the water towers are laid in the Palace itself, which, in case of fire, could throw a jet of water to the top of the centre transept.

When finished, the towers will be decorated similar to the Palace, in blue and white.

Mr. I. K. Brunel was the engineer; and Mr. J. P. Ashton, of the firm of Fox, Henderson, and Co. the contractors, superintended the erection of the towers.

MONUMENT TO MR. LE SUEUR, AT ST. HELIERS.—The monument to the memory of the late Mr. Constable Le Sueur, is now almost finished. The bronze lions' heads destined, hereafter, we hope, to be issues for the refreshing waters which abound on the heights above the town have been placed on the four *façades* of the pedestal; and the inscriptions on the four panels of the base of the pillar are completed, with the exception of the gilding.—*Jersey Times.*

A TREATISE ON BUILDING BY CONTRACT.

THE prevailing mode of executing nearly all building and engineering works by contract having for some years engaged the attention of the writer, he proposes in the following remarks to take a comparative survey of this system with that which was commonly practised thirty years ago, and previously.

In former days it was customary for a person proposing to build, to consult an architect as to the best methods of carrying out his views, and to employ him to estimate the probable cost in detail, and to prepare such plans and working drawings as should, together with his instructions during personal supervision of the progress of the works, ensure the due execution of the original design, or such modifications of it as might seem to be desirable as the works proceeded. The whole of the works were undertaken by one tradesman, or several were engaged, each in his own particular department of mason, bricklayer, plasterer, carpenter, smith, plumber and glazier, slater, or painter.

On the completion of the works, they were measured off generally by the architect and the several parties directly interested, and it was the duty of the former to send in to his employer detailed bills of quantities (the result of the previous admeasurements), and his own valuation. For these labours the architect was compensated by a commission on the outlay, paid by the employer.

This mode of doing business has the following advantage;—the absence of disposition on the part of those employed to be dishonest, or at least the very slight temptation held out to them to be so; for supposing the tradesman to endeavour to take unfair measure, we must also suppose the architect to be either careless, incompetent, or venal, for such an attempt to succeed; and the author believes that architects, as a body, are too respectable a class of men for this evil to apply to any extent. Still, as architects are but mortal, there may be some amongst them to whom any one, or all three, of these characteristics might be justly applied; but as the cost of works generally is very well understood, and forms a most common topic of conversation amongst those interested in the business, culpable acts of injustice are very apt to ooze out in the gossip of those assisting in the admeasurements; and if the employer suspect any thing wrong, he can employ another surveyor and valuer to go through the works, and to supply him with his separate valuation to test the former. The risk of detection in any flagrant act of carelessness, incompetency, or dishonesty, is therefore great, and hence a considerable check is placed upon each, even where higher motives are not at work. Moreover, let it be always remembered, both by employers and architects, that it is the true interest of the latter to keep down the cost of buildings as low as is compatible with fair remuneration to tradesmen.

Another advantage consists in the ease with which works may be altered in their arrangements, or accelerated in their progress, or be suspended, or altogether stopped, at any period of their creation, without subjecting the proprietor to large claims for compensation for losses entailed upon the contractor in work prepared but not put in, in his workmen being suddenly thrown out of employment, or in materials bought and thrown upon his hands,—all which claims may have some foundation in fact, but more frequently have none. It is true these evils operate to some extent under the old system, but are reduced by the whole works being more under the control of the architect, who can generally anticipate any material departure from the first scheme, and by having the whole works under his own eye, check the undue advancement of one portion over the other; whereas it may occasionally suit the convenience or caprice of a contractor to finish one department entirely before commencing another,—as, for instance, he may prepare the whole of his joiner's work in the shop before laying a single brick, and should any alteration take place in the character of the doors and windows, his claim for work prepared but not used would apply. Under the old system the progress of the several portions of the works

would be balanced as it ought to be, and any such alteration would scarcely affect more than one story or division of a building.

A third advantage occurs in the fact of the builder having no interest in substituting worse material or workmanship, or less quantity than that ordered, because the valuer gives him only its equivalent.

The circumstance of its being to every tradesman's benefit to put in as good work as possible, that it may act as a specimen to invite patronage, constitutes a fourth advantage of no small moment.

The disadvantages of this system of "measure and value" are comparatively small, and may probably be summed up in the following;—The difficulty at times of getting work carried on with due rapidity, arising out of the tradesmen having much on their hands, or from a want of activity on their parts, or, perhaps, some negligence. The two latter causes soon provide their own remedy, for if tradesmen become notoriously negligent or inactive, nobody employs them. The first-mentioned cause no doubt occasionally operates prejudicially to the interests of employers; but whether the much-talked-of superiority of contracts, with conditions to complete by fixed periods under penalties in default, has really an existence, is a very open question.

Secondly,—The liability to high prices, which may be kept up by trade-unions, or by the absence of that stimulus to cheapen labour by method and machinery, which the fact of a minimum profit, or no profit at all, unquestionably supplies to contractors. There is, however, but little danger in trade-unions for such purposes: the real cost of work is too well understood, and the small capitalists will always reduce it to its smallest remunerating amount. Neither is it likely that improvements in machinery, giving promise of solid benefits, will be lost sight of in this mechanical age, though it must be admitted, that without the stimulus referred to, the prejudice in some minds for the old mode of doing work will impede their adoption.

Let us now enter upon a consideration of contracts, with their advantages and disadvantages.

Inasmuch as one man from the possession of capital or plant, from locality, from want of employment, or from talent for business, may be able to afford to do certain work for less money than another man, employers may be consulting their own interest by inviting tenders for the execution of the work proposed, and will have the advantage of knowing, or believing that they know, how much money they are about to expend, and that that sum of money is the lowest for which the work can be properly done.

So long as competitions are governed by the above recited considerations only, and the tenders vary in their amounts only as the one or other of such considerations particularly apply in each case, no harm, or but little, can result; but as there are many parties ready to contract to build anything, who have neither money nor plant, and who are without talent or character, employers may rest assured that in an appeal to the building community, they are asking for tenders from some in whose calculations not one of the foregoing legitimate elements will have a place, except the want of employment. Now, such men must live, and they know their only chance of getting a job is "to put it in as low as possible," that is to say, to send in a tender based upon the very lowest prices at which *any* work coming under the *general* description can be done, or actually involving them in a loss.

It is not to be supposed that these contractors (like the old woman) expect to realise a profit by an extension of their losses. They, no doubt, intend to obtain one by inadequate work, by avoiding the conditions of the contract,—or from extras thereupon. The lists of tenders for divers works, which are occasionally published in the *Builder*, wherein the lowest, and generally the accepted, tender is sometimes about half the amount of the highest (and that where thousands of pounds are concerned), show the recklessness (not to call it by a harsher term) with which contractors rush into heavy liabilities.

It is urged by the friends of the contract system, that irresponsible persons need not be treated with; and, indeed, there is usually inserted, in the advertisement for tenders, a notice that the lowest will not necessarily be accepted; but is it too much to say, that it almost invariably is,—and that such persons are treated with, notwithstanding this published tacit avowal of the employer's knowledge, that he is subjecting himself to tenders of amounts, for which his proposed works cannot be properly done? But employers seem to think, that in publishing a declaration to show no favouritism to the lowest tender, they are driving the adventurers out of the competition, or inducing them to put down such prices as should justify the expectation of a fair execution of the engagement, and they almost invariably accept the lowest tender. It is of little or no use the architect saying he does not approve of the party,—that he will not do the work well,—that he cannot at the price, and so forth. The answer of his patron is generally, "That is not your business, nor mine: the man is willing to engage to do the work for a certain sum, after having been warned in the advertisement, that cheapness was not my sole object. It *is* your business to see that he does it well, and in accordance with the plans and specification: you have drawn up the latter with certain clauses for my security, and I shall expect you to see them carried out." Now, herein the architect is an ill-used man: perhaps, out of a dozen competitors, the lowest is accepted, under his protest, as being incompetent, litigious, or unscrupulous, at a price for which he knows the work cannot be well done; and he is told that he is to see that it is: in other words, that he (the architect), is to do the maximum work for the minimum remuneration; for, be it remembered, the architect is paid by commission. Is this liberal? is it even fair? is it not turning the architect's as well as the builder's necessities to account? The philanthropist should look at the justice of the case—the mere man of the world, at the rational prospect of either architect or builder doing his duty under such circumstances.

The writer does not hesitate to affirm, that contractors are almost daily binding themselves to do work for less than it will cost them, and that they are fully aware of this. What, then, is the consequence? Naturally, that they do not fulfil their engagements according to the acknowledged understanding of them between employers and employed, but either put in inferior materials, or leave them out altogether, where they can without detection. It is utterly impossible for an architect to prevent this. To prevent it effectually, he must stand by the workmen and see everything done: this is out of the question, but recourse is sometimes had to a deputy in the shape of a clerk of the works, whose duty it is to see all the conditions of the specification carried out in their integrity. However honest, active, and intelligent this functionary may be, mal-practices on the part of the contractor will be successfully carried out if there is a disposition to adopt them. Superintendents of police have had their pockets picked, although they knew they were in bad company. The best guarantee against dishonesty is the absence of temptation to commit it.

Constantly at war with the contractor, the clerk of the works soon gets into disfavour with the workmen, who, having executed work according to their master's orders, do not like to have it pulled down or found fault with; and his position is one requiring great moral courage, patience, forbearance, and intelligence, and is, consequently, one demanding high wages. Now, if the salary paid to him be added to the amount of the contract, it will be found, probably, that the great saving which held out its allurements, in the sum total of the tender, has broken faith with the employer, and that which should have been spent as the price of *good* work has been swallowed up in expenses incidental to *bad*.

If a builder undertake to do for 900*l.* work which he knows should cost him 1,000*l.* he either does not look to his business as a source of income, or he intends to obtain profit by some dishonesty in the execution of his contract.

An employer may say, "I have nothing to do with this; I will take care, by means of stringent clauses and clerks of the works, that he does not cheat me, and whether he will lose by the job or not is not my business." Mr. Employer, it is your business: you either quietly arrange to involve in a serious loss, an honest man (supposing for the sake of argument the contractor to be one), or (adopting the supposition that he is not), by entering into such a contract with him, and taking care that he shall not impose upon you, you are an accessory before the fact to his robbing somebody else. "Honour among thieves" will scarcely avail you anything in the latter case,—for he will infallibly rob you notwithstanding all your care-taking. But you can go to law with him and obtain damages. Of course you can; but taxed costs will not cover your expenses, and their excess will add something to your intended outlay, perhaps rather more than would have made up the difference between your contract sum and a fair measure and value price of good work.*

GRADUS.

PRIZES TO THE METROPOLITAN SCHOOLS OF ART.

LORD STANLEY of Alderley, as President of the Board of Trade, distributed the prizes to the students of the Metropolitan Schools of Art on Saturday, the 24th, at Marlborough House. In the course of his observations he announced that it had been determined to hold, in the year 1858, an exhibition of those works of ornamental art produced since the establishment of the Schools of Art, as articles of commerce, which, either in their original design, or in their execution, have been carried out by those who have derived instruction from the schools. The works would consist of carvings in all materials, furniture, metal-working, pottery, &c. He also spoke of the other important measure, for promoting the extension of art instruction, to which we have already alluded. Instead of limiting the award of prizes to students taught in the Schools of Art, the Department would hereafter hold examinations at which any person might present himself to be examined in freehand and mechanical drawing.

We were glad to observe the number of female students who have been successful competitors. It is earnestly to be hoped that the special classes of wood engravings, porcelain painting, and others, in which female students have proved themselves so successful, will open a legitimate field of labour to a large number of young ladies, who would otherwise be at a loss to obtain an honourable livelihood.

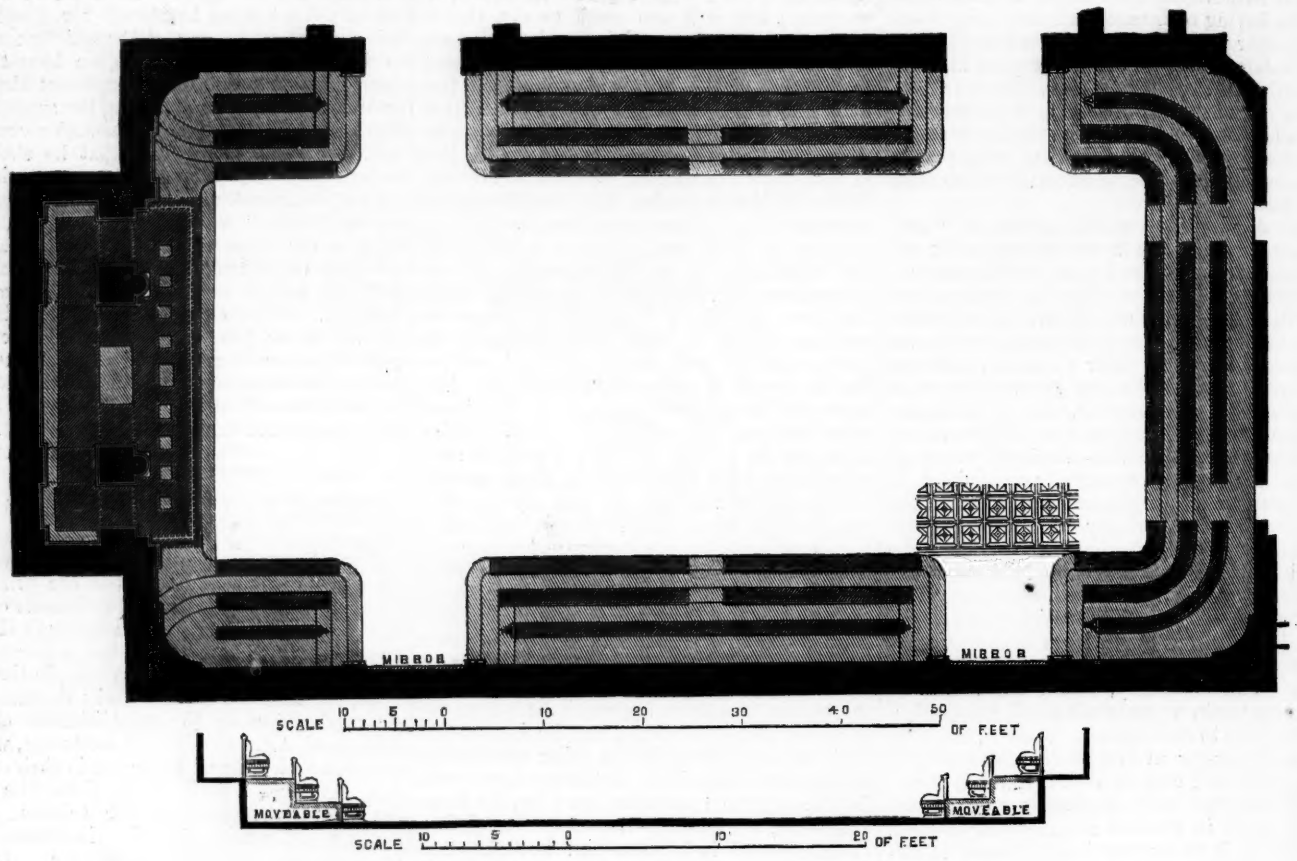
A large number of medals were also awarded to the male students. It is doubtful whether this extremely liberal distribution is calculated to stimulate the students, inasmuch as obtaining a medal seems such an easy matter that more than ordinary care and exertion is not required. The Board of Trade seem to have felt this, and to have wished for some higher prize than the present bronze medal, which should be the reward of greater excellence than that displayed in the regular class drawings. To effect this, the Board have selected four English sculptors (amongst whom is the modelling master at Marlborough House, Mr. Hancock) to make designs for two medals,—one to be the prize in *local* competition amongst the students of each school, the other to be awarded in a *general* competition of the successful works in the local competitions.

THE NEW STATE ROOMS AT BUCKINGHAM PALACE.

THE new state rooms on the south side of Buckingham Palace now completed, were constructed by the late Mr. Thomas Cubitt from the designs and under the superintendence of Mr. James Pennethorne, architect. They include a ball and concert room, a large supper-room, and a promenade gallery, with ante-room and approaches. The sculptures which adorn them are the work of Mr. W. Theed, and the decorations have been carried out under the direction of Mr. Lewis Gruner, in conjunction with the architect. The character of the decorations is

* To be continued.

THE BALL AND CONCERT ROOM AT BUCKINGHAM PALACE.



Plan and Section.

that known as Cinque-cento,—the style which prevailed in Italy, contradictory, as it sounds, in the sixteenth century.

We give a view of the ball and concert room. This is a very fine rectangular apartment, 110 feet long, without the two recesses, at the east and west ends, 60 feet wide, and 45 feet high; including the recesses, the length is 135 feet. At the end towards the west a bold arch, supported by Corinthian columns, and surmounted by emblematical figures of Fame holding a medallion, upon which are the profiles of the Queen and Prince, rises above Her Majesty's seat, as shown in our engraving. The lunette formed by this arch will ultimately be filled with a copy from Raffaelle's Parnassus; it is at present decorated with an allegorical composition, representing "Britannia sanctioning Peace," exemplified by children with branches of olive, while a rising lion indicates the watchfulness and the strength of the nation. At the opposite end another arch, but without enrichments, confines a similar recess, containing the orchestra and a richly, but not very successfully decorated organ. At the foot of this and along the two sides of the room a triple row of seats, covered with red silk, and having a passage way behind, extends, which seats, with the other furniture of the apartments were furnished by Messrs. Johnstone and Jeanes. The roof of the ball-room rests on a wide cove enriched with stuccoes; double beams of considerable projection running parallel and transverse divide the whole roof into twenty-one compartments, each of which is shaped into a deep octagon recess, from which descends a glass burner for gas. The lustres are the work of Messrs. Osler, of Birmingham. Below the cove a cornice and frieze richly ornamented in stucco separate the walls from the ceiling. The upper part of each of the two side walls is divided into thirteen compartments, seven of which are the windows, which at night are filled with gaslights from behind, and six are surrounded with large borders, and represent figures of the Hours, taken from sketches by Raffaelle, and executed above life-size by Professor N. Canzoni, at Rome, where the originals are existing. Within similar spaces at the sides of the arches at the ends of the room, the arms of Great Britain are suspended from flower and fruit knots. Arabesques on gold ground and marbled panels fill the other spaces in the corners, while the four spandrils formed by the arches contain four Cupids from Raffaelle's frescoes at the Farnese Palace. The whole of the length of the lower part of the two side walls is covered with a rich silk, decorated with the national devices in flowers, and executed by Messrs. Jackson and Graham. On the north side of this apartment are two large doors with sculptures by Mr. Theed, of which the one leads from the Promenade-gallery, and the other opens into a similar room called the Approach-gallery, and through which the State dining-room of the palace is reached. Opposite to each of these doors, in the ball-room and concert-room, a mirror of large size, viz. 10 feet by 15 feet, has been placed to correspond with the doors. The ten candelabra of gilt bronze which are placed at the two sides of the seats of her Majesty and the royal family, and at the sides of each of the doors and mirrors, as also the two lustres in the recess on the west end, have been executed by Messrs. Barbedienne and Co. Each of these candelabra supports forty-three wax candles.

The floor is formed in solid parquetry, of wainscot, satin wood, and mahogany. The seats, we should mention, are not fixtures; so that in the event of using the apartment as a Banqueting-hall, they can be taken away, leaving only the raised footway next the wall, to serve as a sideboard for the service.

All the stucco enrichments are beautifully drawn, and with the general arrangement, reflect the greatest credit on Mr. Pennethorne. The Promenade-gallery is 95 feet in length and 31 in height, with a coved roof, from which the apartment receives its light.

The lower part represents an open gallery with vases filled with flowers under its arches; above these a series of panels has been introduced with chiaroscuro paintings of children. Eight busts, by Mr. Theed, are placed along the walls on marble columns.

The Approach-gallery has its walls painted in imitation of tapestry, divided by pilasters, with scrolls, and the two ends have large reliefs, representing the birth of Venus, and Venus descending with the armour for Achilles, in life size.

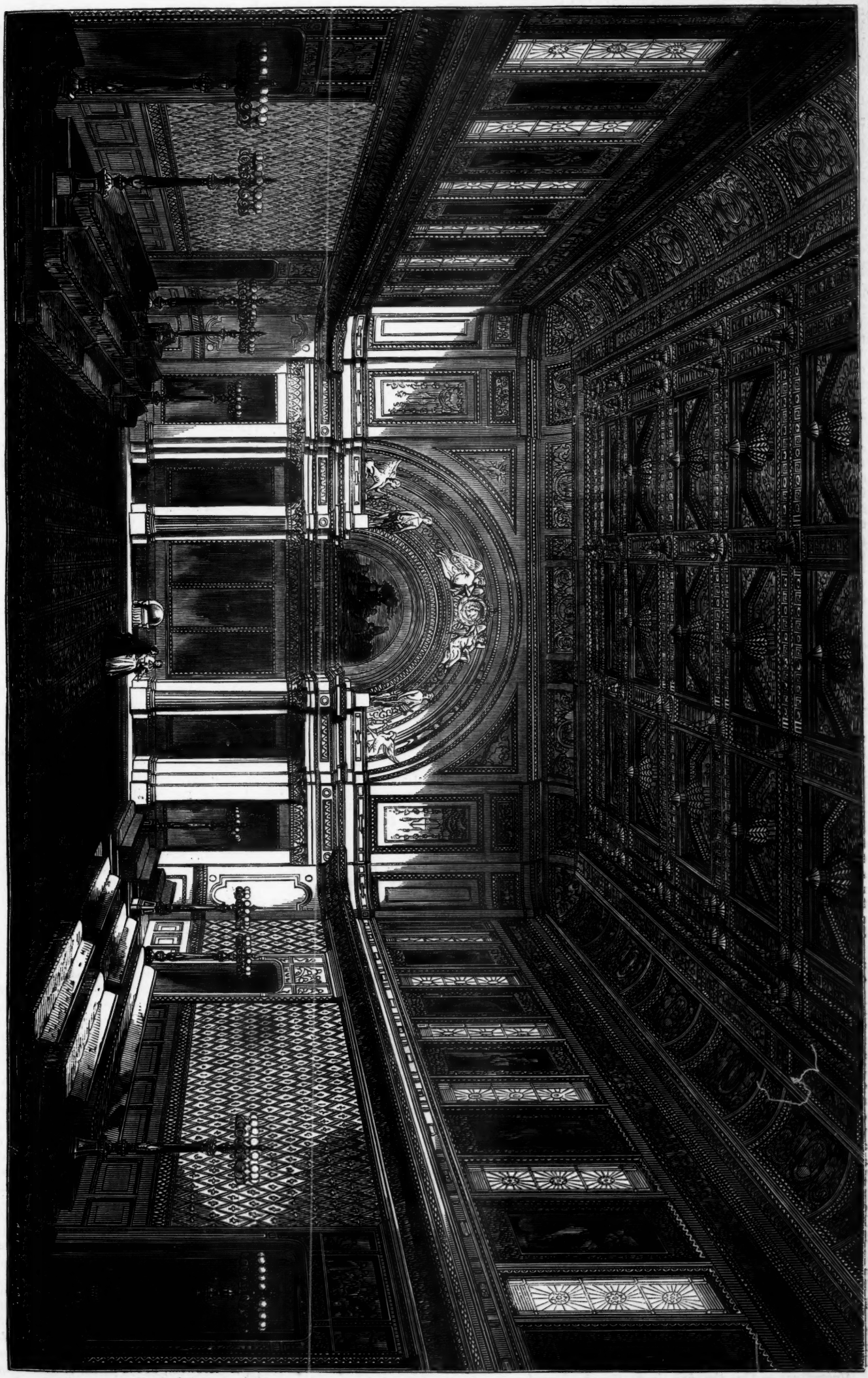
The Supper-room, the last apartment we have to speak of, is not far from a square, being 60 feet one way, and 70 feet the other, and is 45 feet high to the top of the dome. A large blue velarium, sown with golden stars, and bordered by cords and arabesques, extends over the whole of the dome, and it is painted as if the sky were seen beyond, between the cords which tie it down at the foot, and some birds are shown as having entered!

The walls of the upper part of the room are divided into panels alternately painted with arabesques in colour, upon a red ground, and with the royal arms in chiaroscuro on a gold ground, each panel being surrounded by a rich frame. The north and south sides contain a frieze in relief, each divided into one large and two small compositions, of which the principal ones are taken from Raffaelle's "History of Psyche," to which Mr. Gibson, the Royal Academician, has made some additions, the whole having been modelled and executed by Mr. Theed.

In the lower part Mr. Moxon has executed a variety of panels of various coloured marbles, as he has also executed all the other marbles and gilding in the whole building; and we bear willing testimony to the admirable manner in which the imitations are executed.

Many will doubtless find cause for regret that here, at the head-quarters of taste, intelligence, fashion, and wealth, the principle of truthfulness even in decoration has not been adhered to to a greater extent than is apparent: but we need not now discuss the question.

Let us add in conclusion, as affording a useful hint, that in order to study the effect of various combinations of colour, and to determine on the decorations to be adopted, careful drawings in outline of the sides and ceilings of the various apartments were lithographed, so as to afford any number of copies for experiments.



THE BALL AND CONCERT ROOM AT BUCKINGHAM PALACE.—MR. JAMES PENNETHORNE, ARCHITECT.

CHURCH-BUILDING NEWS.

Peterborough.—The erection of the new church of St. Mark, on the Lincoln road, under the superintendence of Messrs. Ellis and Son, is progressing. The site was presented by the Ecclesiastical Commissioners. The edifice is in the Gothic style of fourteenth century, and will accommodate about 800 persons, free. Upwards of 2,800*l.* including 1,000*l.* from the Bishop and 300*l.* by his son, the vicar of Peterborough, have already been guaranteed; but to complete the tower and spire, fence the ground, provide organ, bells, &c. about 700*l.* more will be required.

Ipswich.—The foundation-stone of a new church was laid last week at California, a remote suburb. The church will be in the Perpendicular style, and built of rubble with stone dressings. In plan it will comprise a nave, transepts, and chancel, the latter of apse form. The roof, of lofty pitch, will rise direct from the side-walls of the building. The structure will furnish about 350 sittings, mostly free. Mr. Woolnough is the architect, and Mr. Plumstead the builder.

Braintree.—The restoration of Braintree church is to be forthwith commenced, although the funds fall far short of the required amount, about 1,200*l.* only having been as yet secured, including 250*l.* from the Incorporated Society.

Brentwood (*Essex*).—The church in this town, erected about twenty years ago, being too small for the increasing population, has rendered an enlargement necessary; and this is to be effected by erecting a new chancel and chancel-aisle, which will occupy the extremity of the site, east of the church. The aisles will be gabled north and south, and thus the difficulty got over of adding to the wide span and roof of the present church. The walls will be of rag, with Bath stone dressings; the roofs, waggon-headed, with the main timbers showing. The arches opening into the chancel and nave will be divided by parclose screens, and the stall seats will be open and of massive construction. The floor is to be laid with tiles. A memorial east window is already in Mr. Ward's hands, and two others of painted glass are expected. Mr. Joseph Clarke, of London, is the architect.

North Kilworth (*Leicestershire*).—The interesting Early English chancel of this church is being entirely restored and re-seated, with a new roof, &c. The works are being carried out by Messrs. Law, of Lutterworth, under the direction of the architect employed at the Brentwood church. The east window will be painted by Mr. Holland, of Warwick, as a memorial to the rector's family. The doing away with the old square seats, the removal of a fire-place and a tall brick chimney, the unstopping and restoration of the windows and chancel arch, and the removal of the present flat roof and ceiling, are amongst the works. The plastering is to be done in party colour.

Wardle (*Rochester*).—The foundation-stone of a new church for the village of Wardle was laid on Friday in week before last. Mr. G. Shaw is the architect. The style of the architecture is Early English. The building will consist of a chancel, nave, two side aisles, vestry, and organ-room, tower and spire, the latter occupying the south-west angle of the church. The roofs will be open-timbered, supported on columns, with clerestory. There will be no galleries. The accommodation will be for 500 persons, and the estimated cost, including architect's commission, warming apparatus, and other minor matters, is about 2,500*l.* It is expected to be finished about next May. The contractor is Mr. E. Taylor.

Tunbridge Wells.—On the 9th inst. an influential public meeting was held at the Town Hall, Tunbridge Wells, to consider a proposal for the erection of a new church in the town.

Weymouth.—A new tower, with peal of bells, are proposed to be added to St. Mary's church here. The design for the tower has been prepared by Mr. Pierse Arthur.

Wimborne.—The building of the new choir at the Minster is progressing. The organ is being reconstructed with modern improvements by Mr. F. S. Blount.

Malmesbury.—On the 8th inst. Garsdon Church was reopened, having been rebuilt at considerable cost. The new church is in the perpendicular style, with open stained roof, and uniform sittings for rich and poor. The builder was Mr. Chapman, of Frome. The operative mason was Mr. Francis Bowman, of Malmesbury. The architects were Messrs. Coe and Goodwin. There is a balance of 200*l.* due to the builder yet to be made up.

Tenbury.—Greet church has been restored and re-opened. Mr. Cranston, of Birmingham, was the architect employed, and Mr. G. Smith, of Tenbury, the builder.

Godmanchester.—It is in contemplation to put up a memorial window in the chancel of the church here, in token of respect to its former vicar, the late Rev. Charles Gray. It is calculated at a cost of 400*l.* The Dean and Chapter of Westminster have given 50*l.*; and the subscriptions already amount to nearly 200*l.*

Bath.—Some time since the citizens of Bath resolved to erect a monument in the Abbey Cemetery, as a memorial of the officers and private soldiers connected with the city who fell during the late war. The monument, of which Mr. S. Rogers, of Widcombe, is the sculptor, will be nearly twenty feet high, according to the local *Chronicle*. Its material is the finest pennant. "The design was derived from Père la Chaise." It is in the form of an obelisk, with wreaths on the faces. On the sides of the pediment will be engraved the inscriptions.

Prees.—The consecration of the new church at Fauls, an outlying district of Prees parish, in Shropshire, took place on Tuesday before last, according to the *Shrewsbury Chronicle*. Viscount Hill gave the site and the bricks, and the parsonage, now in the course of erection near the church. The church is in the pointed style of fifteenth century. It consists in plan of a simple parallelogram, 54 feet long by 17 feet wide inside, and, with the gallery at the west end, is capable of holding between 150 and 200 persons. It is almost wholly constructed of bricks. The dressings of the windows and details are of Grinshill stone, and various devices are worked in black and red brick on the face of the walls. At the junction of the body of the church and chancel, is a small open-timbered bell-turret. The roof is covered with Staffordshire red and blue tiles, of varied patterns. The interior is fitted up with open seats. The east window is to be of stained glass, representing the Crucifixion. The western window is in the wheel fashion, variegated with tracery. The architect was Mr. Ferrey, and Messrs. Nevett, of Ironbridge, were the builders. The cost was about 700*l.*

Uffington.—The church of Holy Trinity, Uffington, near Shrewsbury, was consecrated on Wednesday in last week. The new church consists of a nave and north aisle, 43 feet by 27 feet, separated by an arcade of stone-work; a chancel 21 feet by 18 feet, and two chancel aisles 11 feet by 9½ feet each. The style is Early English. The walls are of white Grinshill stone. The roof is of oak. The windows on the south of the nave are arranged in single and coupled lancets. The north aisle has also coupled lancets; the organ aisle having tripled lights cusped and the old Norman loops. The east-end has a wheel window, surmounting three single lancets. The floor is of encaustic quarries, laid on hollow chambers, damp proof, and capable of being filled with hot air. This mode of warming renders unnecessary all wood flooring. The east and south windows of the chancel, the eastern and western windows of the south aisle, and the western lancet, have been filled with stained glass by Mr. Evans, of Shrewsbury. The remaining windows have been glazed in cathedral glass, varied in shade, each light being charged with one or more roundels or squares, containing scriptural subjects,—this being part of the collection of foreign glass left by the late Rev. W. G. Rowland to Mr. Corbet, of Belmont. The squares on the south side were obtained from the Abbey of Einsiedlen, Switzerland: the roundels were from Belgium. The architect, from whose designs the edifice has been erected, is Mr. Samuel Pountney Smith, of Shrewsbury. Mr. Ralphs, of Uffington, has carried out the woodwork, and acted as clerk of works; and Mr. Smith, of Grinshill, erected the masonry. The whole of the timber has been supplied from the Sundorne estate.

Wrexham.—The tender of Mr. Ebenezer Thomas, of Menai-bridge, for the new Church of St. Mark, to be erected at Wrexham, has, according to the *Wrexhamite*, a local paper, been accepted. The amount of the tender was 4,561*l.* Mr. Thomas was the contractor for Gwersyllt Church. The successful competitor for the design of St. Marks was Mr. R. Kyrke Penson. The edifice is to be ready by 25th April, 1858. The requisite funds have not yet been fully subscribed.

Walsall.—The foundation stone of a Parsonage, in connection with the Church of St. James, at Ogley Hay, was laid on Monday before last. The architect of the Parsonage-house (which is in accordance with the style of the church) is Mr. G. T. Robinson, of Leamington; the builders, Messrs. Hardwick, of Birmingham, who also built the church.

Rainhill (*Liverpool*).—The new Chapel at Rainhill County Lunatic Asylum has just been completed. It stands at some little distance from the Asylum, at the north-east corner of the grounds. Mr. H. P. Horner, of Liverpool, was the architect. His instructions were to provide accommodation for a congregation of 350, but "with a view to future enlargement and strict economy of cost." The style is the late geometrical. The edifice consists of a nave, south aisle, south porch, belfry, and turret-spire, at the north-west angle, a small waiting or resting room for patients adjoining the turret, vestry near the north-east angle, and organ aisle on the south-east. The lower portion of the turret forms a north-west porch. The nave and aisle are separated by a series of six arches of dressed stone on octagonal stone piers. The roofs are open-timbered of simple carpentry, curved ribs over the communion space and champers on the angles being the only approaches to decoration. The wood is slightly stained and varnished. The timbers of the roof rest on the plain stone corbels in the nave and aisle, and a hexagonal ventilating louvre, surmounted by a spire-roof and vane, rises from the roof near the east end of the nave. The east window of three lights is fitted with stained glass, by Messrs. Pilkington, of St. Helen's, from a design by Mr. Horner. A diaper pattern, intermixed with bands inscribed with appropriate texts, fills the body of the lights, and the heads have symbolic letters, combined with foliage. A small quatrefoil light in the gable is also filled with stained glass. The west window is of four lights, this and the east having moulded internal jambs. The seats are open, excepting those for the choir and officers; the whole, except those obtained from the old chapel, being of varnished deal. The turret spire, with a light gilt cross which crowns it, is sixty-four feet in height: the other principal dimensions are as follow:—

	Ft.	In.
Extreme internal length	88	0
Length of aisle	73	0
Length of organ aisle	15	0
Width of nave	22	0
Width of aisle	13	0
Total outside breadth	42	0
Height of nave roof to ridge	37	0
Height of aisle roof	18	9

The building is of stone, furnished by a quarry on the site, and from which the asylum was built, the materials of the original chapel being also used in the new one. The external stone-work is of "Cumberland walling," with dressed quoins, jambs, &c. The contractor for the whole was Mr. H. Fisher, of Birkenhead. The amount of the contract was 1,283*l.*

Chorley.—The Chorley Improvement Commissioners have purchased the land for the cemetery for upwards of 3,120*l.* and have let the contract for the erection of the three cemetery chapels to Mr. Thomas Banks, of Chorley, joiner and builder. The chapels will be of the following dimensions;—Church of England, 32 feet by 18 feet; Dissenters', 24 feet by 24 feet; and Roman Catholic, 32 feet by 18 feet.

East Keswick.—On Saturday in week before last the foundation-stone of a new church was laid at East Keswick, in the parish of Harewood. The site, which is in the centre of the village, has been given by the Earl of Harewood, and com-

prises two roods twenty-three perches. The building will consist of a nave, chancel, porch, and vestry; the whole surmounted with a small spire. It will accommodate about 300 people, and the works, which are let to Mr. Hall, of Leeds, are expected to be completed about the end of the year. Messrs. Mallinson and Healy, of Halifax, are the architects. The building will be in the Early English style.

Carlisle.—A new Wesleyan chapel has been erected at Hallbankgate. Mr. Beattie, of Brampton, was the architect. The building, according to the *Carlisle Journal*, is in the Early English style, and is 42 feet 6 inches long by 32 feet 4 inches wide; height to ridge, 32 feet 6 inches, and will seat 200 persons. It stands on elevated ground.

PROVINCIAL NEWS.

Chelmsford.—The tender of Mr. S. Simpson, of Ipswich, for the erection of the new Corn Exchange here, at the sum of 4,923*l.* was accepted, there being four other tenders, of which the highest amounted to 6,450*l.* and the lowest to 5,697*l.*

Great Pandon, Essex.—The interior restoration of this little church, with a late transept added by Sir Josiah Childs, the eminent banker, soon after 1600, is now being completed, under the direction of Mr. Joseph Clarke, architect. The old seats in the nave will be restored, and followed throughout the nave; whilst in the chancel the stall seats will be of a richer character. The same architect is carrying out a village club-house: the walls will be of coloured brick, with a high open roof, and accommodation for reading, with a supply of tea and coffee from a bar at the end. Attached will be a smoking-shed, and every inducement to attract the labourer from the beer-shop.

Oxford.—A model of the public fountain proposed to be erected in St. Giles's, was exhibited in the Public Library, used as a withdrawing-room at the civic banquet. From the designs, it appears that the fountain would be 50 feet high and 50 feet wide at the base, with a jet over all of 50 feet, making the total height, when playing, 100 feet. The uniformity of the stem is broken by two smaller basins, the water of the main jet falling into them in succession before reaching the largest. Surrounding the latter, it is proposed to have seven sculptured figures representing Great Britain, France, Turkey, Sardinia, Austria, Prussia, and Russia, each emblematical of the peace, and throwing a jet of water. The name of the originator of this design and model did not transpire.

Liverpool.—The surveyor of the Liverpool Dock Trustees has reported that the connection between the lines of railways belonging to the trustees, at the north end of the Sandon dock, and the high lines of railway communicating with the Lancashire and Yorkshire and the London and North-Western Railways, are completed, and that a circuit by rail is now complete on the dock quays.

Manchester.—The front of the new Free Trade-hall, in Peter-street, has just had a piece of allegorical sculpture placed in the circular head of each of its nine windows. The centre piece represents free trade, with outstretched arms and open hands. On her right hand Europe is seated, followed by Asia, with the arts and manufacturers. On her left are Africa and America, with agriculture and commerce. All the work is in bold relief. In each case a single figure represents the allegory; but to each are added the various emblems, &c. which help to render intelligible the idea of the artist. The attitudes and draperies of the nine female figures are so disposed as to produce varied effects. The sculptures have been executed by Mr. Thomas, of London.

Blackpool.—The building of a school, in Bank Hey-street, for infant children, was commenced on Tuesday before last. The building is to consist of a school-room and mistress's house, with rooms for pupil teachers, after a plan prepared by the architect of the council on education. A large play-ground is to be attached to the school. The estimated cost is 682*l.* Mr. Thomas Topping has contracted for the whole building, under the superintendence of Messrs. Myres and Veevers, of Preston. Upwards of 200*l.* says the *Preston Guardian*, are still required to complete the undertaking, in addition to the amount promised.

Sunderland.—The erection of the new Sailors' Home has been let, says the *Shields Gazette*, to Mr. Alexander Thompson, of the firm of Thompson and Hunter, and will be commenced immediately, so as to be ready for habitation by November term. The building embraces two large rooms for the use of the Marine Board, with other smaller rooms. The Home embraces a spacious dining-hall, one large front sitting-room and library, and one large smoking and sitting-room. There are also about forty small bedrooms, intended each for two shipmates, with separate beds; while contiguous to these will be the baths and washing-rooms, with all the other necessary appliances for carrying out the objects of a sailors' home.

LIGHTNING AND CONDUCTORS.

THE following notes, made whilst going through M. Arago's "Meteorological Essays," lately published by Baron Humboldt, may not be uninteresting to some of your readers.

J. D. J.

"The celebrated Duhamel du Monceau says, that lightning, unaccompanied by thunder, wind, or rain, has the property of breaking oat-stalks. The farmers are acquainted with this effect, and say, that the lightning breaks down the oats."

NOTE.—This is a well-received opinion, I know, with the farmers in Devonshire. It may amuse our country members to inquire into the extent of this belief.

"In thunder weather the barking of oak-trees is said to be effected with less difficulty than when the day is fine, the wind in the north, and the sky clear."

Bodies shattered by Lightning.

"The hypothesis entertained on this subject is, that lightning by its action developes, in the substances which it traverses, an *eminently elastic fluid*, the tension of which must inevitably act in all directions. Would it be a very hazardous supposition if we were to assume the elastic fluid in question, to be no other than the vapour of water?" *i.e.* that the tension we have spoken of is the *force of steam*.

"Lightning, as we have seen, fuses thin metallic wires. May we not conclude, also, that it will render incandescent the minute aqueous particles which it may find in its passage?

"What force would water not have at the much higher temperature of red-hot iron? Such a force would evidently be adequate, in point of intensity, to all we know of the mechanical action of lightning."

"Suppose humidity in the fissures or small cavities of a block of freestone; and if struck by lightning the steam developed will shatter the stone to pieces, and the fragments will be projected to a distance in every direction."

Effects of Lightning on Animals.

"In the summer of 1774, lightning struck two persons who were under a tree: portions of their hair were thrown to the top of the tree."

"A workman was struck in a tavern: portions of his hat were found incrusted in the ceiling."

NOTE.—This of course is caused by what is termed the "up stroke" of lightning. Two years ago in this neighbourhood [Worcester], a hay trusser left his rick on the approach of a storm. Lightning struck the tree and the man: it split the bark of the former and destroyed the man: his shoes were burnt and much of his clothing, portions of which were driven up into the tree.

A Hint to the Ladies.

"A lady was putting out her hand to close a window during a thunder-storm: the lightning darted, and a gold bracelet which she wore disappeared altogether, so that no vestige of it was found: she herself received only some slight hurts."

"When lightning falls on men or animals, ranged either in a straight line or in an open curve, it is at *the two extremities of the line* that its effects are, generally speaking, most intense and disastrous."

"This has been exemplified where lightning struck a stable in which were ranged thirty-two horses, when the two outside horses were killed! When lightning encounters an iron bar, it is only on entering and quitting it that it does much damage."

Precautions against Lightning.

"Franklin recommends persons to avoid the neighbourhood of fire-places. Lightning does, indeed, often enter by the chimney, on account of the internal coating of soot which is one of the bodies for which, as for metals, it evinces a preference."

"For the same reason, avoid as much as possible metals, gildings, and mirrors, on account of their quicksilver."

The best place is in the middle of the room; unless, indeed, there should be a lamp or chandelier hanging from the ceiling.

"The less the contact with the walls or the floor, the less the danger. A hammock, suspended by silk cords, in the middle of a large room, would be the safest place."

"In the absence of the means of suspension, the next best place is on substances which are bad conductors, such as glass, pitch, or several mattrasses."

"These precautions must be supposed to diminish the danger, but they do not altogether remove it."

"There have been instances of glass, pitch, and several thicknesses of mattresses being traversed by lightning."

"It should also be understood, that if the lightning does not find round the room a *continuity of metal*, which it may follow, it may dart from one point to another diametrically opposite, and thus encounter persons in the middle of the room, even if they were suspended in hammocks."

"The greater the mass and the volume of the conducting matter brought together in one place, the greater the chance of being struck by lightning in its neighbourhood.

"There is another cause which may contribute to render numerous assemblages of men or animals dangerous during thunder-storms.

"Their *perspiration* cannot fail to occasion an ascending column of vapours, and it is well known that moist air is a better conductor of lightning than dry air: such a column has a natural tendency to attract the lightning, by preference, to the place whence it proceeds. Need we, therefore, be surprised that flocks of sheep are so often struck by lightning, and that a single stroke should sometimes cause the death of thirty, forty, or even fifty of these animals."

Is the danger of being struck by lightning increased by running, or by rapid motion, during a storm?

"The rapid motion of any body leaves behind him or it a space, in which, mathematically speaking, the air is comparatively rarified. All other circumstances being equal, lightning will be more likely to strike such space."

NOTE.—Hence, ride for your life in a storm.

Lightning Conductors.

"All other circumstances being equal, lightning directs itself, generally speaking, to the *most elevated* portion of edifices."

"All other circumstances being equal, lightning directs itself, by preference, to *metals*. When, therefore, a metallic mass occupies *the most elevated* point of a house, we may feel pretty nearly certain that lightning, if it falls, will strike that point."

"Lightning, which has entered a metallic mass, does mischief to the surrounding masses at *the moment when it quits the metal, and at the vicinity of the point or points at which it issues from it*. A house, therefore, may be rendered safe from its highest point to its foundation, *if the metallic parts of the roof are prolonged without interruption to the ground.*"

"When there are upon the roof or summit of an edifice several distinct metallic masses *completely separated from each other*, it is difficult, and even impossible, to say which of them will be struck by preference. The only safe practice is to unite all these various metallic masses by rods of iron or copper, or bends of lead, zinc, &c. so that there may not be any one of them which shall not be in *metallic communication* with the bar which is destined to transmit the lightning to the damp earth, and which runs down one of the upright walls of the building."

"*Damp earth* offers to the fulminating matter which is passing along a bar a channel, by which it escapes easily, and *without detonation* or damage, provided the *bar plunges a little deeply into the earth.*"

"By a proper conductor, I mean, on the one hand, that it should go into the ground until it reaches *earth, which is always damp;* and on the other, that it should be *sufficiently massive* to transmit the strongest lightning without being fused by it."

"A pointed rod is much more effective than a blunt one."

"In order to protect an extensive building, it would be necessary to arm it with several lightning-conductors, and the *less the length of the rods, the more they must be multiplied.*

"In certain cases, *oblique* rods may do good service.

"Platinum points are to be preferred to copper ones, not only on account of their unalterability under the action of water or air, but also on account of their *infusibility.*

"The conductors should be preserved from rust by a coat of paint.

"When the conducting bar enters the ground, there is an alternative between two opposite difficulties.

"If the soil is *humid*, the fulminating matter passes off easily; but the metal *rusts and is soon destroyed.*

"If the soil is *dry*, the bar lasts a long time; but it fulfils its function very badly. It was, therefore very desirable to discover some substance which should be a good conductor, but which should not injure iron. *Charcoal, when it has passed through a red heat, is of this description.*

"In passing the eaves and cornices, the conducting bar is sometimes bent into a right angle, and sometimes into an acute angle. Such *inflections become dangerous:* care should be taken to make the necessary changes of direction by *gentle curves.*

"We do not learn either from the Bible or Josephus, that the Temple at Jerusalem was ever struck by lightning, during an interval of more than a thousand years, from the time of Solomon to the year 70, although, from its situation, it was completely exposed to the violent thunderstorms of Palestine.

"By a fortuitous (?) circumstance, the Temple was crowned with lightning conductors quite similar to those which we now employ, and which we owe to Franklin's discovery.

"The roof, constructed in what we now call the Italian manner, and covered with boards of cedar, having a thick coating of gold, was garnished, from end to end, with long pointed and gilt iron or steel lances, which Josephus said were intended to prevent birds from resting on the roof, and soiling it.

"The walls also were overlaid, throughout their extent, with wood thickly gilt. Lastly, there were, in the courts of the Temple, cisterns into which the rain from the roof was conducted by *metallic pipes.* We have here both the lightning-rods and a supply of means of conduction so abundant, that Lichtenbergh is quite right in saying that many of our present apparatuses are far from offering in their construction so satisfactory a combination of circumstances."

A STROKE OF LIGHTNING AT BROMPTON.

As a practical illustration of the necessity of attending to the teachings of science to prevent evil from the presence of that powerful agent, electricity,—an agent always and everywhere at work,—we may mention what occurred at Mr. Rymill's, house, Brompton-crescent, on the 17th inst. It was raining while the family were dining, and Mr. Rymill sent his servant downstairs to take out a bell-trap close to the front of the house, that the water might get away. He had opened the lower door, and was about to stoop to do so, when the maid-servant called to him that she had already removed it. That call saved his life: an electric flash descended diagonally past the front of the house to the spot he would have occupied: as it was, he was struck down and remained insensible for a considerable time. The fluid seized upon the copper bell-wire, which it fused wherever a brass crank occurred to break the connection, leaving marks of the explosions on the wall, and in one case it fused part of the crank itself. It passed through a small hole in the front wall, along the wire, into the house, to the extent of 3 or 4 feet, and then, meeting the bell-spring, appears to have returned in preference along the copper wire to the outside, where the wire was inclosed in a zinc tube up to the garden-gate, up which it ran to a distance of about 45 feet, where, first again fusing the wire at its junction with a crank, it passed away. Mr. Rymill has reason to be thankful.

THE EMPEROR OF THE FRENCH AND MODEL LODGING-HOUSES.

THE emperor, anxious for the well-being of the working classes of Paris, has caused to be announced in the *Moniteur*, that he has, at his own cost and risk, undertaken the construction, on a grand scale, of model lodging-houses, for which purpose he has caused 18,000 metres of land to be bought on the Boulevard Mazas. The *Labourers' Friend*, in mentioning this, says,—"The necessary and happy consequences of all prudent and well-considered enterprises is gain; and, as no enterprise can be more prudent than to supply a pressing and daily increasing demand, there can be little doubt that these lodging-houses, when finished, will leave a large profit upon the capital invested in them, for the home accommodation for the poor is at present very inadequate to their wants; but, as if to meet in advance all possible suspicion of self-interest in this generous undertaking, it is expressly stated that "so soon as the letting is completed, the lots will be granted, at cost price (*au prix de revient*), to such persons as will undertake to build within the term fixed upon, and according to a given plan."

EXPERIMENTAL ARCHITECTURE IN AMERICA.

OUR readers may be glad to hear what is being said about architecture in America. The following is from the *Transcript*:—

The first thing that strikes a stranger in Boston is its admirable commercial buildings. An Englishman, for instance, must be surprised at our light, airy, yet substantial warehouses, compared with the cavernous, ill-ventilated, yet often flimsy structures, in which business is transacted in London.

In other parts of our city, perhaps the most striking fact is the absence of uniformity. It is evident that we are studying architecture in the way that we are studying everything else,—experimentally. The book architect says, 'You musn't use this or that feature: it's contrary to the rules of the pure Greek, or the pure Gothic, or the pure Renaissance.' 'Pure fiddlestick,' says the Yankee: 'you say that won't do, I'll try and see. You say that design there is meant for a base: now I think it would look well turned upside down, for a cornice, I guess I'll try.' Accordingly, a conspicuous building in Summer-street has such a cornice: The experiment, to be sure, is not strikingly successful.

Again, a sensitive classicist says, 'Don't touch, with rude fingers, these ancient, sacred forms. You may copy a little, but be careful to copy exactly. Don't dare to shake up these wonderful fragments.' 'I'll just try,' says the Yankee; and he shakes the kaleidoscope till it shows him a fair interior cornice—new out of the old,—classical yet original,—and he puts it up in Winter-street. Honour to the successful boldness of that man, whom, by the way, too few have honoured.

One says, 'I'll try an iron building. For ornament, I'll try what I've seen used in stone.' The experiment is going on, and the Yankee begins to see how insipid are Corinthian caps of cast-iron,—how all the interest of the delicate carving is lost when it comes to be cast. You can see he feels nervous, for he is smearing them with gum and sprinkling them with sand, a sort of tar and feather architecture. We won't give up the iron. It is not the material which has failed, but we were mistaken in subjecting it to stone ornament.

The 'trimming' style of building has been tried on and worn threadbare. One courageous man says,—'I'll try a cornice made of the old homely brick, on my big building up in Washington-street.' People look at the cornice, and remark how it grows out of the wall, as if necessarily of the same material; and they find that they can dispense with the binding after all.

Now the way the Londoners manage is the reverse of all this. An architectural guild has settled everything by rule and line. The great divisions are sharply marked out—Greek, Gothic, Revival. These architects have copied three Greek monuments, and piled them one upon another at St. Pancras. They have frozen the Gothic into the Parliament Houses. They have smeared the great town with stucco moulded into renaissance ornament.

The Greek was god-like when it blazed with colour above the blue sea: the ghost of the Parthenon is yet lovely: the Gothic is sublime in Westminster Abbey: Whitehall, and St. Paul's, and Somerset House, are graceful and imposing. But the question is, 'Why should the world be filled with bad copies of Whitehall?' London is full of unsuccessful, ineffective, renaissance buildings: English architecture is frozen.

Now what is to save us from falling into the same stupor? Our very barbarism. We are saying, in our rough way, 'We won't be bound by your rules: we'll try all sorts of things in all manner of places.' By-and-by, perhaps, we shall see clearly the truth that merit in a building depends on the developement of that building's individuality, consistently with its position in time and space;—in a word, that 'its architecture should be a function varying with the variation of all its co-efficients;' hence that preceding styles should be *used* for instruction, not *abused* for imitation.'

SUNDERLAND DOCKS.

INSTITUTION OF CIVIL ENGINEERS.

ON May 13th, the evening was entirely devoted to the discussion of Mr. Murray's paper "On the Progressive Construction of the Sunderland Docks," read at the previous meeting.

It was said that the site of the docks was very peculiar, inasmuch as they had been constructed on ground gained from the sea by the action of groynes projected from the shore. There had been originally much doubt as to the feasibity of that plan or mode of proceeding: it had however proved very successful. The dams employed were novel in construction, apparently cheaper than usual, and had been used with success in exposed positions. There had occurred some casualties with one of these dams, which were ingeniously met, and would be intercsting features in the paper if added before publication.

All the harbours on the north-east coast suffered more or less from the formation of bars across the mouths of the harbours themselves, or of the rivers leading to them. The difficulties in keeping open the channels were considerable, and the scouring power hitherto employed had not been very successful: the system used at Sunderland appeared to be better devised, and the results were stated to be superior to anything attained elsewhere: it would be very desirable to be well informed on all these particulars.

The effect produced by the three southern groynes placed seaward of those originally constructed, had been to collect a mass of sand and *débris* on their southern sides; whilst the old groynes at the northern end of the embankment collected the sand on their northern sides. This apparent anomaly was due to the action of the litoral currents, which set sooner into Hendon Bay than at the mouth of the harbour, in consequence of the tidal wave having a more rapid progress in the deep water of the offing than along the shallow water of the coast. In consequence of this, there was a counter-current northwards from Hendon Bay, and similar counter-currents existed both north and south of the mouth of

the harbour, caused by the projection of the piers. A point had been observed between the northern and southern groynes, where there was a junction of these tidal currents, indicated by a spit of sand and gravel.

The coffer-dam in the tide-way of the river enclosed 2½ acres within it; there was considerable difficulty in obtaining a secure footing for the main piles, but after a deposit of clay had been made, the object was effected, and being secured together by walings and bolts, the dam proved quite water-tight. A series of raking shores inside gave great solidity to the structure, and enabled the rock to be excavated close up to the inner piles.

The sea coffer-dams of the channel were, however, of a different construction;—the object being to protect the inner dam by another in front of it, in skeleton, secured by a deposit of clay brought up to the low water-mark. The inner dam had then a mass of clay deposited on the interior side, having a tendency to force it outwards, but this effect was prevented by a series of raking shores. This pressure had the desired effect of keeping all in place, although powerfully acted upon by the waves of the sea. On more than one occasion it had been found necessary, during raging storms, to add extra weight to the dam, by bringing waggons, heavily loaded with rubble stone, along the railway, to the centre part. The effect of this additional weight was to impart greater stability to the structure, even when the waves were lashing against the timbers with considerable violence.

The average cost of the three channel coffer-dams, for timber, iron, and labour in fixing, and for depositing the clay, amounted to 19*l.* 3s. per lineal yard; and deducting from that sum the value of the timber which had been used in other portions of the work, the actual cost had been 16*l.* 12s. per lineal yard of coffer-dam, exclusive of the expense of rooting out the timbers and removing the clay. When compared with coffer-dams of the usual construction, even in situations not exposed, as these were, to the action of the sea, the cost was very moderate.

The scouring conduits were supplied by water from the half-tide basin, through archways, into a well 40 feet long, on each side of the shipping entrance. The four entering ports from each well were closed by shuttles, having the cills all laid at one level of 23 feet below the datum, or 8 feet 6 inches under low water of ordinary spring tides.

Each entrance was 7 feet wide by 9 feet high, and the conduits were separated into two, for a short distance within the discharging ports.

	Under low water of spring tides. Ft.	In.
The first pair adjacent to, and on either side of, the shipping entrance had their bottoms laid at the depth of ...	12	0
The second pair beyond on each side ...	9	4
The third pair „ ...	7	4
The fourth pair „ ...	5	4

The sectional areas of the last-mentioned pairs were about 10 per cent. less than the sectional area of the entering ports, being each 7 feet wide by 4 feet high.

The sectional areas of the first-mentioned pairs were about 20 per cent. less than the entering ports, being each 6 feet 9 inches wide by 4 feet high.

The sectional areas of the intermediate pairs were proportioned in like manner, with the intention of keeping up the force of the currents; and on plan the conduits had the form of a fan, for the purpose of conducting the issuing water into the centre of the channel.

The area of the Great Dock, with the Southern Half-Tide Basin, was taken at 34 acres = 1,481,040 superficial feet.

The scouring water, at an ordinary spring tide, might be lowered to the permanent level in the dock, being a depth of 4 feet 6 inches.

Hence, 1,481,040 × 4·5 = 6,664,680 cubic feet of water available for scouring.

Eight apertures, each 7 feet wide by 9 feet high	= 504	sq. ft.
Deduct 10 per cent. for friction through the conduits	= 50	„
Gave as available area for scouring water	= 454	sq. ft.

	Ft.	In.
Then the rise of an ordinary spring tide...	= 14	6
Deduct for rise of tail-water	= 1	0
	13	6
The mean depth 4 feet 6 inches ÷ 2.....	= 2	3
Leaving mean pressure	= 11	3

which was calculated to produce a velocity of 862·44 feet per minute. Then 862·44 × 454 = 391,548 cubic feet per minute,

and $\frac{6,664,680}{391,548}$ = 17 minutes

Deduct 2 minutes consumed in opening the shuttles, leaving 15 minutes available time for scouring.

Assuming $\frac{6,664,680}{15}$ = 444,312 cubic feet per minute, which, passing through the sectional area of the channel, on the inner side of the pier heads = 1,232 square feet.

$\frac{444,312}{1,232}$ = 360 feet per minute,

= 4·091 miles per hour for the mean current,

= 3·166 miles per hour along the bottom, which was a current capable of carrying along large shingle and broken stones.

The effect of an experimental trial had been most conclusive. Although a large quantity of clay remained in the channel of the outer coffer-dam, standing at the height of 6 feet above the bottom, and consequently holding the water within it in a quiescent state, yet when the shuttles were drawn, although there was a depth of 16 feet of water in the channel, or 4 feet above low water of spring tide, and the pressure of the water in the docks only 10 feet, and when closed was reduced to 7 feet, the column of issuing water caused that in the channel to be heaped up; and, being prevented by the channel cut through the marly rock, from escaping laterally, the whole mass of fluid was set in motion like a river. Meeting with the resistance of the clay in the outer coffer-dam, it rose and fell over it, as a tumbling bay; and even then the course to seaward was strongly visible on the surface, for a distance of more than 2,000 feet beyond the pier-heads.

It was stated, that Mr. Murray might be congratulated on having carried out a system of sluicing which promised to be useful in important cases. It was argued, that a marked distinction should be drawn between the operation ordinarily mis-called sluicing, or scouring, and the much more effective principle applied in this case. In the former, the object was to direct a small stream of water, with a high velocity, directly upon the spot to be scoured; and though this was usually effective, in removing deposit from one particular place, it only carried it a short distance away, to be soon again deposited; and hence, as at Dover and many other places, this system of scouring had, from its inefficiency, fallen into disrepute. The process, however, adopted at Sunderland, was on a different principle, namely, to create what might be called a temporary artificial river, which, running in a well-defined channel, for a certain time, at low water, should not only scour or clear the bed of such channel from deposit, but should carry that deposit away to a considerable distance. The velocity with which this scouring stream should run could be perfectly regulated by the sluices, the only object of which became, in this case, to supply such a quantity of water into the channel as would impart and maintain the velocity required: they, therefore, should be so placed as to distribute the supply widely, and thus to insure an equable stream in the channel. It was considered important, that the channel should become gradually narrower towards the mouth, so that the stream might act with the greatest power on the part where the deposit was most likely to occur. Confident expectations were held out, that by the more general application, under suitable regulations, of this system of sluicing, deep entrances might be efficiently and economically maintained in situations where they would otherwise have been impracticable.

THE HOUSE OF PEERS ON ARCHITECTURAL AND ART IMPROVEMENTS.

ON Friday, 23rd inst. Lord Ravensworth brought several points of architectural and sculptural interest under the notice of the House of Lords. His lordship first alluded to the projected approaches from Pall-mall to St. James's-park, and remarked, that in connection with the proposed improvement it was expedient to consider whether the east front of St. James's Palace might not be made a little more ornamental. The central gateway was a fair specimen of the style in which it was erected, but on the east side of the gateway was a most faulty specimen of that style, crowded with windows, and so rotten as to risk being blown down by the wind: it was surmounted, too, by chimney-pots not fit for farm-houses. As to the internal accommodation, the ladies of England who attended her Majesty's levees had but too much reason to complain. The ground wasted in courtyards might provide a large amount of accommodation. He wished to call the attention of Government to these desirable alterations. With reference to metropolitan statues, his lordship pointed attention to the fact that one of the pedestals in Trafalgar-square was still unoccupied. In Hanover-square there was a statue of Pitt, on a lofty pedestal, while northward, in a direct line, was one of Lord George Bentinck in Cavendish-square, where also an equestrian statue of William, Duke of Cumberland, stood on so low a pedestal that it could not be seen to advantage, being overshadowed by the higher statue adjoining. The grotesque effect ought to be obviated by placing it on a higher pedestal, and turning the figure in a different direction. The statue of the Duke of Kent, at the top of Portland-place, one of the widest streets in the metropolis, was too small to terminate such a vista, hiding itself as it did among the trees. The position reminded him, with the alteration of a single word, of the line in the Latin poet:

"*Nec* si cupit, *ante* videri."

He suggested the removal of the statue to the front of the new entrance to Buckingham Palace, in compliment to her Majesty. His lordship concluded by suggesting that now the pictures of Turner had been decided in Chancery to belong to the nation, they should be provided with a fitting gallery, and restored to the light. If a building could not be at once erected, Government ought to hire a public room, where the pictures would be safe from injury, while the public would have the advantage of seeing them. Lord Redesdale was of opinion that a straight road past Buckingham Palace, at the west end of Pall-mall, would be preferable to the park improvement proposed by the committee. His lordship thought there should be no line of road at all across the park. The Marquis of Clanricarde agreed with Lord Redesdale as to the straight road, and with Lord Ravensworth as to the want of accommodation at St. James's Palace, which was unbecoming the dignity of the Sovereign. Lord St. Leonards called attention to the state of one of the fronts of Somerset House, disfigured by two rows of chimneys, and suggested the removal of such an eyesore. It was impossible for any one to walk the streets and not be convinced of the want of a pile of buildings for the offices of the Government. The Earl of Malmesbury also urged similar views, and remarked that the Foreign Office was in so critical a state that it had to be propped up, and it may be remembered that a great part of the roof fell in some years since, and nearly destroyed the inmates. The accommodation for the reception of distinguished foreigners was disgraceful to the country. The Marquis of Lansdowne was understood to say that notice had been given in the other House for a committee in order that it might consider the plans and proposals which would be laid before it on the subject of new Government offices. Besides being an ornament to the metropolis, he believed that the erection of new buildings would ultimately prove more economical than any other way of providing the accommodation required. Earl Stanhope said that forty years ago there were no public statues but statues of royal personages. Now there were many of eminent public men. The great want, however, with respect to these statues was the omission of any inscription on the pedestal, except the name and date of birth and death.

METROPOLITAN BOARD OF WORKS.

AT a meeting of the Board, on Monday last, a report in favour of Mr. Bazalgette's plan for the sewage interception and main drainage of the districts *south* of the Thames, was carried, on the motion of Mr. Carpmael; and a deputation was appointed to see Sir Benjamin Hall on the subject. A point was raised by Mr. Leslie, touching the proposed outfall at Plumstead, which will probably lead to the removal of the outfall farther from London.

The scheme for the drainage of the north side of the Thames has been printed.

THE PROPOSED MEMORIAL OF THE '51 EXHIBITION.

IN reply to the subscribers to the memorial who have addressed us on this subject, we are enabled, by Alderman Challis, to state that differences of opinion as to the mode of carrying it out have alone postponed the fulfilment of the idea. The money collected has been funded, and before long we shall probably be able to announce the course determined on. The money was subscribed for a memorial of the Great Exhibition, and to that specific object it should be applied.

TO COLOUR MORTAR.

IN reply to the inquiry at p. 280, to colour mortar for what is called front work, I would recommend [illegible] ashes (passed through a fine sieve), in *equal* proportions. This will make an excellent hard *dark* mortar. Should a darker colour be desired after this admixture, a less proportion of sand to a greater of smiths' ashes would do it; also, if soot were added to the water previously to its being chopped up with the lime, &c. it would assist. But what is the best, "*after all*," would be to add black oxide of manganese: this

would be a lasting colour, which no weather would deface: the quantity required of this latter is but small, and is well understood by a "good bricklayer." It is used for staining the red roofing tiles to imitate slate.—J. B. W.

Notices of Books.

Examples of Antient Domestick Architecture. By FRANCIS T. DOLLMAN, Architect. Part I. London: Bell and Daldy. Also at 6, Albert-street, Regent's-park.

THERE has been a lull for some time in the production of ancient examples: Mr. Dollman breaks it worthily. He proposes in the work before us to illustrate the hospitals, bede-houses, schools, almshouses, &c. of the middle ages in England. In the present part, he gives ten plates, four from St. John's Hospital, Northampton, and six from Grey Friars [or Ford's] Hospital, Coventry, the latter one of the most beautiful specimens of mediæval wooden construction in the kingdom. The accuracy of Mr. Dollman's pencil is known to most of our readers.

Miscellanea.

STONEMASONS' DISPUTE AND DISTURBANCE AT YORK.—Mr. Lucas, the contractor for the stonemasons' work required on completing the additional buildings at the North and East Riding Pauper Lunatic Asylum, at Clifton, has had a dispute with his workmen, and he discharged twenty of them on 26th ult. and on 7th inst. brought nine men from Bradford, who were intimidated by his old hands, and prevented from continuing in his employment. One of the discharged workmen used threats, for which he has been sentenced to a month's imprisonment, with hard labour, the magistrates remarking that they were resolved to break up so fearful a combination; and that while workmen had a right to combine for their mutual protection, they had no right to tyrannize over their fellow-workmen, or to prevent their former employers from obtaining new hands. One of the causes of the disagreement was a demand made in course of the contract work of a rise in wages of 6d. a day, to which, however, the employer agreed for a time, to suit his own convenience. Another was a demand of short time on Saturdays. One of those who appeared for the defendants charged with intimidation, said the employer agreed to give the increased wages, with three months' notice, but had turned them off at a fortnight's notice. One of the magistrates, in reference to the unlawful combination, said the secretary and treasurer of the club were each liable to three months' imprisonment.

NEW PUBLIC HEALTH BILL.—In the House of Commons, last week. Mr. Cowper, in moving for leave to introduce a Bill to amend the Public Health Act, stated that the measure was rendered necessary in order to correct the defects and ambiguities of the old Act. His Bill was to give power for the effectual cleansing of pavements, and removal of refuse and filth from the rear of houses. It would empower authorities to establish a system of drains and sewers to be carried out at a certain distance from the houses, also out-falls and reservoirs, into which the refuse or sewage could be carried. It would provide for sewage being applied as manure where practicable. The Bill would also extend the power of raising money for the erection of public works, and for repayment of the same over fifty years. The Bill was only intended to apply to towns where there was no representative government. Leave to bring in the Bill was then given.

TO CLEAN WINDOWS.—Windows should be cleaned with whitening, mixed very smoothly in some water: the addition of a very little *gin to the water* is a great improvement: afterwards polish with chamois leather. In Holland, small garden-engines are used in cleaning windows on the outside, an excellent plan, if used very early in the morning.—J. B. N.

ON THE CULTIVATION OF FLOWERS IN WINDOWS.—There are fewer tests of a happy home *within* than the flower-decorated window, and neatly-kept garden; and there is no occupation for the leisure hours more calculated to keep it so, or to soothe the mind. It yields pleasure without surfeit: the more we advance, the [illegible] and, how unlike this is to most of our worldly engagements! To those *blessed* with children, how delightful it is to bend their young minds to a pursuit so full of utility and intellectual instruction, combined with the advantages usually accompanying industry; and in children, carefulness and thought about their plants will lead to the same feelings respecting other matters.

J. B. N.

THE MANCHESTER FINE-ART EXHIBITION BUILDING.—A meeting of the subscribers to the guarantee fund for the forthcoming Fine-Art Exhibition Building, at Manchester, was held in the Town-hall, Manchester, on Tuesday in last week, when it was resolved to hold the exhibition next year. The Earl of Ellesmere was elected president, and the Mayor of Manchester, chairman. A report was read, announcing that her Majesty had accorded her patronage, and the Prince Consort his favour to the proposed exhibition, although the prince regretted that previous exhibitions had not resulted in any permanent benefit to the district in which they had been held. The deputation who waited on H.R.H. however, assured him of the great probability of a permanent Museum of Art and Industry being established on the foundation of the Manchester Exhibition. An offer had been received from Messrs. Young and Co. of London and Leith, the contractors for the new Museum building at Kensington Gore, to erect a fire-proof building capable of holding 20,000 people for 22,500*l.*; the original estimate being 25,000*l.* The total estimated expenditure will be 40,000*l.* Messrs. Fox, Henderson, and Co. had also sent estimates. The building is to be erected in six months' time. The guarantee fund consists of thirty-two subscriptions for 1,000*l.* each, and sixty for 500*l.* each,—in all, 62,000*l.* Our readers will have seen that a design for the projected building has been advertised for.

NEW WESTMINSTER-BRIDGE.—In reply to Mr. Henley, on the 19th inst. in the House of Commons, Sir B. Hall said that, after he came into office, the contractors for the works of the new bridge became bankrupts, and he placed the matter, which was attended with very great difficulty, entirely in the hands of Messrs. Rendell and Simpson; and he hoped, in a week or two, to be able to lay their report on the table of the house, as to the present state of the works and the course they recommended to be adopted.

NEW STREETS.—I have this moment read your proposition for a new street, east and west. Could not something be done towards opening the communication with Leicester-square, by continuing King William-street, Strand. This was intended by Mr. Nash, but was prevented by the obstructives of St. Martin's, who would not consent to part with their workhouse—it was so "dear to them." If this could be accomplished, it would remove, from one of the finest sites in the metropolis, a nuisance of so extensive a character, that it is presumed its equal is not to be discovered in mighty London.—A. B.

THE IRON TRADE.—Complaints prevail in Staffordshire that orders come slowly in, and the nominal prices of last quarter-day have not been sustained, an extensive system of "underselling," as it is called, being prevalent; in other words, the nominal prices are, as usual, a point rather to be aimed at than realized. In Yorkshire and Derbyshire, the trade is rather in an active state. The ores of Northamptonshire are coming into extensive use.

MANCHESTER ROYAL INSTITUTION.—In connection with the forthcoming Exhibition of the Manchester Royal Institution, it may be useful to mention that the Exhibition will open about three weeks after the close of the Royal Academy. The council are particularly anxious to obtain as good an exhibition as possible, and for that purpose the Honorary Secretary, Mr. Edward Salomons, has been in London, to obtain pictures from the artists. The inducements held out to contributors, are the general taste for the fine arts in Manchester, and the valuable pictures that are there purchased.

TENDERS

For erecting six pairs of semi-detached villas, near Reading, Berks, for Mr. C. E. Vine. Mr. W. H. Lovett, architect:—

Reed	£9,460	0	0
Taylor	9,247	0	0
Kelly and Son	8,496	10	0
Corbet	7,950	0	0
Partridge and Co.	7,898	0	0

For the erection of St. Thomas's Church and Parsonage-house, Lambeth. Mr. S. S. Teulon, architect. Quantities supplied by Mr. Poland.

White	£6,911	0	0
W. Higgs	5,983	0	0
Macey	5,983	0	0
Avis and Sons	5,980	0	0
Wilson	5,893	0	0
J. Higgs	5,748	0	0
Pollock and M'Lennan	5,685	0	0
Todd	5,517	0	0
Myers	5,100	0	0
L. Wilson	5,100	0	0
Dove	4,878	0	0

For additions and alterations to a villa at Herne-hill, for Mr. J. D. Welch. Messrs. Tillett and Chamberlain, architects. The quantities not supplied:—

Messrs. Thompson	£1,130	0	0
Messrs. Pritchards	990	0	0
Brass and Son	978	0	0
Benj. Wells	902	0	0
Jennings	893	0	0
W. O. Wills (accepted)	880	0	0

For Training College, Liverpool. Messrs. J. and C. Hansom, architects:—

Anderson	£4,820	0	0
Baynes and Son	4,792	0	0
Nelson	4,442	0	0
Ladd	4,350	0	0
Jump and Son (accepted)	4,297	0	0
Nicholson and Eyre	4,190	0	0

For building a new church, on the site of the present one, St. Mary Magdalen, Kilby, Leicestershire. Mr. H. Goddard, Leicester, architect. Quantities supplied, and the old materials to be the property of the contractor:—

Young, Oxford	£1,480	0	0
Harrold, Hinckley	1,375	0	0
Porter, Leicester	1,368	0	0
Loveday, Kibworth	1,346	0	0
Lindley and Firm, Leicester	1,335	0	0
Rushin, ditto	1,286	0	0
Cox, ditto	1,250	0	0
Johnson, ditto	1,238	0	0
Broadbent, ditto (accepted)	1,199	0	0

TO CORRESPONDENTS.

"T. H. H."—"T. G."—"Fire."—"G. D. D." (shall appear).—"Competitor."—"J. H."—"R. V. L." (the contract can be stamped afterwards. An appraiser's license is not required, for making out bills of artificers' work).—"A. O." (license is not necessary).—"An Old Subscriber"—"J. S."—"S. and Son."—"E. O. W." (the roof as shown is not necessarily very early; the framing of the rafters at the foot is similar to that in the roof of Heckington Church. The window shown may be of the twelfth century).—"W. B."—"W. R."—"G. M. O. J."—"C. B. A."—"E. P. E."—"Dr. G."—"W. W." (next week).—"J. D. and Sona."—"W. C."—"F. T. D."—"H. C." (there are several such schools, but we decline recommending).—"E. L. B."—"E. J. P."—"Solid Sewage Manure."—"C. M."—"H. H."—"P. L. C."—"A Freeholder of Princes-terrace."—"J. M."—"P. O. P."—"O. P. Q." (no).—"Messrs. D."—"F. W."—"R. R."—"G. S."—"W. H. V. S."—"S. J. T."

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MESSRS. RUSHWORTH and JARVIS will SELL by AUCTION at the GALLERIES in University-street, on TUESDAY, JUNE 3rd, and two following days, (the Premises having been disposed of) the important COLLECTION of WORKS of ART in marble, comprising the Group of the Laocoon, the size of the original in the Vatican, six grand terminal figures, each nine feet high, four noble busts of Roman Emperors, five beautiful allegorical Groups, many charming figures, including Canova's Venus, Diana robing Psyche, Niobe, Hercules, Dying Gladiator, Groups of the Graces, Mars and Venus, a finely executed Fountain, with Bacchanalian figures; Hero, an original figure by Fontana, also Psyche by Tenerani, the Nymph of the Arno, fine Cinque Cento Vases, Trajan's Column, in rosso antico (very rare), a valuable circular malachite Table, 51 in. in diameter, beautiful Mosaic Tables, three costly Oriental alabaster Vases of large size, many fine bronze Groups, Figures, Busts, Vases, and Ewers, several beautifully sculptured Louis Quatorze, and other chimney-pieces, suitable for mansions of the first-class, in statuary and other marbles; a large and valuable collection of Pedestals and Candelabra in Scagliola, choice Florentine Mosaics; a few grand Gallery Pictures, and other works of art.—Catalogues may be had on the Premises and at the Offices of Messrs. RUSHWORTH and JARVIS, Saville-row, Regent-street, and 19, Change alley, Cornhill.

NOTICE.—To TIMBER and MAHOGANY MERCHANTS, CABINET-MAKERS, and OTHERS.—The next Liverpool Periodical SALE of MAHOGANY and other FURNITURE, Baltic and American Whitewoods, &c. will take place in the WOOD SALES SHEDS, south end of the Brunswick and Toxteth Docks, Liverpool, on WEDNESDAY, the 11th, THURSDAY, the 12th, and FRIDAY, the 13th JUNE next, beginning at NOON precisely on the first day, and resuming at TEN o'clock in the morning of the second day, and at NOON on FRIDAY, the third day.—Catalogues, containing full descriptive particulars, may be had on application to EDWARD CHALONER, Timber and Mahogany Broker and Measurer, No. 6, East-side Queen's Dock, Liverpool.

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NORWICH NEW WORKHOUSE.—NOTICE to ARCHITECTS.—ADDENDA to INSTRUCTIONS.—The accommodation to be provided for Class 2 of both sexes is to consist of 16 separate but contiguous rooms, each capable of containing 10 persons, for Day-room and Dormitory purposes. The Plans, &c. may either be sent by post or parcel, prepaid, or delivered at my Office, Little Orford-street, Norwich, on or before the day named in the instructions.—By order, Norwich, May 22nd, 1856. E. C. BAILEY, Clerk.